

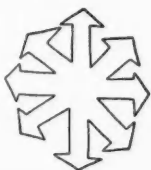
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a quarterly publication of

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The English language edition of *Diogenes* is published quarterly in December, March, June, and September by the University of Chicago Press, 5750 Ellis Avenue, Chicago 37, Illinois. Entered as second-class matter at the Post Office at Chicago, Illinois.

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Six parallel editions of the review are published simultaneously:

English: Published and distributed in the United States by the University of Chicago Press. Subscription rates for U.S.A. and possessions: 1 year, \$4.00; 2 years, \$7.50; 3 years, \$10.50. Canada and Pan American Postal Union: 1 year, \$4.50; 2 years, \$8.50; 3 years, \$12.00. All other countries: 1 year, \$5.00; 2 years, \$9.50; 3 years, \$13.50. Single copies: \$1.25.

French: Published by Librairie Gallimard, Paris.

Spanish: Published by Editorial Sudamericana, Buenos Aires, Argentina.

German: Published by Kiepenheuer und Witsch, Cologne.

Italian: Published by Fratelli Bocca Editori, Rome.

Arabian: Published by the Librairie Misr, Cairo, Egypt.

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Printed in the U.S.A. at the University of Chicago Press, Chicago 37, Illinois

DIOGENES

Number 19

Fall, 1957

CONTENTS

PIERRE AUGER	Two Times, Three Movements	1
CHARLES G. BELL	Early Christianity: Arts and Soul	18
MARÍA ZAMBRANO	Dreams and Time	32
BEN B. SELIGMAN	On the Nature of Economic Growth	42
ROBERT H. LOWIE	Primitive Messianism and an Ethnological Problem	62

NOTES AND DISCUSSION

HAROLD ORLANS	Some Attitudes toward Death	73
ROGER CAILLOIS	Unity of Play: Diversity of Games	92
<i>Notes on the Contributors</i>		123

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TWO TIMES, THREE MOVEMENTS

The arrow and the wheel have both been used to represent time, which has been measured by the flowing of water or sand, unilateral and definitive, or by the movement of a needle on a dial, an ever recurring cycle. These two aspects of time—the unlimited advance without stop or return and the cycle which passes again and again through exactly the same states—have for various reasons preoccupied both philosophers and astronomers. A universe of infinite duration which never returns to any of its preceding states, the sort suggested by application of the second principle of thermodynamics, has little appeal for certain thinkers and leads them to a sort of cosmic pessimism. A cyclical evolution, on the other hand, with an eternal return to states, if not identical, at least very similar, to the one in which we live, gains more sympathy by providing the mind with a sort of repose, a vague consolation for death. This preference can be observed in action whenever the progress of astrophysics presents a new hypothesis on cosmic evolution. The expansion of the universe, an irremediable evolution, met with a hostility which, under cover of scientific arguments, concealed an affective malaise induced by metaphysical anguish in the presence of this final fading-away, far as it might be from our day. The theories which say that nebulae evolve but regenerate, and which lead to a sort of permanent

Translated by James H. Labadie.

Two Times, Three Movements

regime in the universe, enjoyed, on the other hand, a very wide success, the deeper reason for which is not always admitted or even consciously recognized. It may be simply a vague feeling of similarity between the human microcosm and the macrocosm which makes us perceive in the thermal end of the world a great general death, as hateful as our own death, while a cyclical or permanent universe presents a pulsing and persistent life similar to the one we feel in ourselves and in our race. But is there, in fact, any basis of reality accessible to science? Or does this profound disparity between a flow which is lost without hope of return and a duration which conserves something—or finds it again—correspond to nothing more than purely subjective classification?

Before beginning an analysis of the notion of time, and in order to establish it on a solid base, let us touch briefly on the structural level of matter—the atomic level—and note how things present themselves in this microscopic world composed of distinct individuals, atoms or molecules, governed only by their reciprocal relationships. The equations of physics are written there, as in our familiar universe, as a function of time. But various authors have noted that the time which figures in the inner laws of the atomic and molecular structures does not have exactly the same meaning as the time introduced in formulas representing their exterior (whether classical or statistical) mechanics. Interior time, that of wave mechanics, has no unique direction, and its sign can be changed without affecting the validity of the results—as is the case in ordinary mechanics where stationary waves are concerned. It is a “time,” beyond all doubt, but one which does not advance in some way or other, which does not lead to an evolution, more or less slow, but inevitable. Long before their internal laws were seriously analyzed, it had already been said that atoms and molecules do not age. An atom of oxygen which beheld the formation of the earth is still identical to itself at this moment. It may, during the ages, have undergone temporary transformations, been ionized and then neutralized, entered into combination with other atoms and been freed. It shows not the slightest trace of these incarnations and, after several billions of years, is perfectly “clean” and brand-new. This is also true of molecules when they are replaced in the same chemical state; they are always exactly the same, and no distinction is possible between those which have just been formed and those which have been constituted for thousands of years. It is an essentially immaculate universe, exempt from any contamination by the past, without anguish for the future. It is also a universe where nothing is irreversible and where one can always return to a former state—

by means of some expending of free energy—and leave it again under no handicap. It is a universe always alert, where nothing is lost, nothing tires, where affinities a thousand times satisfied and undone are always equally alive and ready to see the same steps retraced.

The picture changes completely if statistics are introduced, that is, when the object of our study includes numerous atomic or molecular elements. These individuals are independent of one another, or, rather, they present among themselves but brief and weak links deriving from gravitation, from electric and magnetic polarizations, forces whose characteristic is the power of varying in a continuous fashion. A description of the state of such an ensemble should be based on the movement and the relative position of the various elements of which it is made. But the parameters, which can vary in continuous fashion, are so great in number that we must generally be content with indications of a statistical order, either on the vivacity of the movement—leading to the notion of temperature—or on the relative proportions of the different atomic or molecular species—leading to the evaluation of the concentrations. Temperatures, concentrations, all general parameters permitting a definition of our ensemble, evolve with time, and here we are concerned with an oriented time, an arrow, which goes forward and cannot be made to turn back, since the laws themselves cannot be turned back in time, as in the case of individual atoms. And with this inexorable time appear all the characteristics which separate our familiar universe from that of the atoms: the decrease of energy which little by little (but irretrievably) breaks down all the ordered structures which we utilize or construct; memory, that is, the traces of the past which are inscribed on solids, in the movement and the composition of fluids; the alteration and impurity from which the universe of the atoms is exempt and which are a part of that memory. This evolution in the course of time, slow or catastrophic, is such that one cannot return *exactly* to an initial state, even by an expenditure of free energy, for no power on earth can replace individually atoms or molecules in the situation (and in the conditions) where they were earlier in a scheme of continuous parameters. This is why on our scale everything ages, changes, and never turns back; it is why our familiar world possesses a future and a past—and it is also why the present which separates future from past cannot be grasped. The atoms have but one present, eternal, except in case of catastrophe.¹ They are, as the physicists modestly put it, in a “stationary” state.

1. Catastrophes which, by the way, are reparable.

Two Times, Three Movements

All this obviously poses a series of problems, for it is not easy to admit that time, the fourth dimension of the universe, appears under two such different aspects.² And, first, if time is but an eternal present in the atom, what is to become of all those internal movements to which the physics of the past half-century has accustomed us? Now we are told that the position of the electrons in their orbits cannot be precisely determined, except that they are everywhere present to a certain degree. But what, then, is the meaning of the kinetic energy they possess or the mechanical moments resulting from their rotation? To explain the latter, it would seem necessary that these particles move in a certain direction—that, consequently, they have a future and a past, however short and however quickly effaced these may be by cyclical returns.

A close analysis of the instantaneous and successive events in the complex structure of atoms and molecules is however unrealizable, forever ruled out by what are called the "laws of indetermination." Two attitudes are then possible: one consists in refusing every concept which cannot by its own nature lead to observable facts—and consequently in accepting as a whole the dynamic present offered to us by atoms; the other leads us to suppose the existence of movements of the ordinary type within the atoms, with positions and speeds, but forever separated from us and all the rest of the universe by an impenetrable shell. This second attitude sees in the different atoms of oxygen present around us individuals different from one another, since their inner state cannot be identical.³ But it gives no procedure for designating, sorting, and classifying them in relation to these supposed internal circumstances. It would be prudent then to admit the inaccessibility of the interior of atoms and to permit full rein to time without direction, and movement without stages—since there are no events which might be used to mark them.

Returning to our familiar world, we find spatial dispositions and displacements by which we mark off advance of time: needles on a dial or return of our globe in its position in relation to the sun. But we know that these mechanical movements, even if they appear perfectly cyclical, never close at exactly the same point; the clock wears out, the earth's revolution slows down, and the sun itself consumes its supply of hydrogen. A great movement sweeps the whole universe, a great evolution which at every

2. A duality in the nature of time has, however, already been considered for different reasons, particularly by Milne and Haldane.

3. While the first point of view, although it distinguished one atom from another, found them equal.

moment lowers the potential of order by widening the domain of chaos. Hot bodies radiate, cold bodies absorb; rapid particles are slowed by shocks and become "ordinary citizens" of cosmic gasses or solids. This evolutionary movement, to which the notion of entropy is attached, takes place inexorably in one direction only, the entropy increasing in every isolated part of the world. It is linked to the continuous character of parameters which allow a description of every portion of the universe without presenting any of the levels of stability which we have encountered among atoms and molecules, even when they were undergoing change. It flows, it flees, it is indeed a movement linked to that arrow-time which our efforts can neither stop nor slow down—that time which leaves behind it the fine traces of memory, then the marks of age, and, finally, a few fossils.

In the presence of these two times and of the two movements inscribed in them, we must call attention to several rather paradoxical situations. Intra-atomic time is an immovable present, but it leads to sudden changes which have no history. Statistical time passes ceaselessly, but in its framework can be found precise marks of past events. It is in the inner movement of the atom—in the strict, pure world where everything, like Achilles, is "fixed in large steps"—that the vague area called "indetermination" resides, an area in which the only solid supports on which the future may be built are evaluations of probability. It is in the statistical motion of the universe, in the middle of this great shoreless river whose flow cannot be stopped or reversed, that scholars calculate with certainty to the tenth decimal place. But are not these paradoxical aspects due only to the contact of two worlds, atomic microcosm and universal macrocosm? And does not this dualism also give birth to the third movement which represents life and which leads its creatures toward a richness of constantly increasing complexity?

Before penetrating the terrain of life itself, let us look more closely to see what may be the nature of the contacts between the two worlds we have just described. Is the transition from one to the other absolutely sudden, and does it represent a metaphysical barrier, or, on the contrary, might one find certain characteristics which enable us to understand the other even in the absence of a freely open passage between the two? This was tried, with success, in the early days of the quantum theory, in the form of Bohr's principle of "correspondence." If one applies the continuous laws of classical physics to the planetary systems which, at that time, were sup-

Two Times, Three Movements

posed to exist in the atom, various rules can be deduced which are in effect verified by observations, at the same time that the principal characteristics of these observations require the introduction of the discontinuous laws of quantum physics. This correspondence is all the more exact for the fact that the calculation is applied to states of the atom where quantum numbers are greater, and which thus approach the macrophysical systems where continuous physics reigns. There exists a clear boundary between these two physics, but in the vicinity of this limit one notes a sort of preparation for the crossing of the boundary.

Inversely, if statistical systems (of the kind represented by a gaseous volume, for example—and which are under the jurisdiction of the laws of classical thermodynamics) are supposed to be maintained for a long time in absolute isolation, i.e., without any external intervention (even for observation), one can apply the quantum theory to them. They should then be considered as being in discontinuous states, escaping entropic evolution, and consequently plunged into time of the first sort, into an indefinite present.⁴

In this last example we may in a way catch in action one of the characteristic elements of the passage from microcosm to macrocosm. In fact, if we heed common sense, we will reason as follows: we are dealing, after all, with a gas, composed of molecules in great but well-determined numbers; at any instant we might therefore decide to verify by observation the situation and the motion of these molecules and thus to penetrate into time of the first species, which is reputed to be impenetrable. We could do this in principle, but at the price of breaking the isolation which was a part of the condition of the supposed experiment. To observe molecules, we must illuminate them, bombard them with photons and electrons, and profoundly trouble their movements. We would, in short, be acting like an investigator who, wishing to follow the development in the thought of a group of friends engaged in conversation, made each of the participants submit from time to time to judicial questioning. Time of the first sort and the type of movement linked to it do not admit the presence of an observer; or, rather, every observation ends its career, its present, and casts it into a new period having no continuous relation with the former. Moreover, it requires for its establishment a considerable duration of these isolated states—all the greater in that the number of particles involved is great and that they are less dependent on one another.

4. Of course it is not surprising that they should escape entropic evolution, since they are isolated and can therefore neither receive nor lose energy, and since they are in thermic equilibrium because of the very long duration of the experiment.

A precise analysis of the circumstances in which external events can influence the permanent interior state (stationary state) also leads to a sort of "tangential junction" between the two qualities of time. Let us take the simple case of an electrified particle in rapid motion which passes near an atom or molecule. Thanks to its electric charge, it can exercise an action on those elements of the atomic system which are themselves characterized by an electric charge. Under certain well-defined conditions this action may end the stationary state by substituting another, thus bringing about one of those interior crises which separate two successive elements from the discontinuous existence of the atom. Now among the conditions required for an effective action is a condition of time, and what is still more remarkable is that this condition is the reverse of that generally produced in the macroscopic world within which an action of long duration is more assured of bringing about a decisive result than is too brief an action. For atoms, on the contrary, it is an action of short duration—or at least of duration less than a certain critical value—which has the greatest chance of producing an effect. Such a "premium for violence" is encountered in classical mechanics only in the case of systems of periodic motion. When a pendulum receives a brief shock, it begins to move. A progressive attraction by a nearby body, which lasts much longer than the pendulum's period of free oscillation and which also stops progressively, finally produces no effect: the external force is thus exercised in vain on the attached point of the pendulum. A link can thus be observed between the critical duration of action on an atom and an interior period, so that every more rapid action has a chance of exercising an effect on one of the parts of the atomic system and of acting on it as though it were free, while a slower action finally exercises an effect on the ensemble, thanks to the intervention resulting from the interaction of the different parts on each other. It would be only too easy to find analogies in human affairs: an attempt to persuade one member of a social group has chances of success if it is rapid and energetic. If it is too slow, social bonds will intervene, the reaction ceases to be individual, and the external action encounters the total mass of the group.⁵ There, too, a critical duration could be defined, dependent upon the rapidity of the exchanges and their intensity: this is a duration characteristic of interior time, apparent to observation only if caused to be "put in gear" with exterior time by an intervention located in the latter. Finally, one can choose among microphysical systems those which present to the

5. The occasional success of an action of long duration is due to the fact that it led to a "conversion" of the individual under consideration, who no longer obeys the same laws.

Two Times, Three Movements

highest degree the properties of isolation in relation to external conditions, that independence of internal conditions vis-à-vis the surrounding macrocosm, by which I mean atomic nuclei, and more especially the nuclei of radioactive atoms whose permanent state is suddenly brought to an end by a spontaneous crisis which causes them to throw off a part of their mass, leaving them in a new state vastly different from the first. We know that these perishable atoms do not grow old any more than stable atoms but that they have, throughout their existence and during each unit of passing time (as measured by external observation), an equal chance to undergo the crisis which disintegrates them. If we reason within the internal time of the atom, that probability of explosion is simply one of the permanent and unchanging properties of the present reigning therein. It does not permit any evaluation or measurement of the time which would pass in the way of external time, since, if the crisis takes place, internal time simply ceases to exist—and since, so long as it does not take place, no event occurs which might announce the crisis. For the outside observer as well it can serve no purpose, and for the same reason, in the case where the atom observed is the only one of its kind. But, if we are concerned with a sizable number of identical atoms, everything changes, for the observation of their successive crises allows us to follow and to measure the flow of time—of entropic time, of time without return. Here, again, by means of the bias of statistics, the time which passes is connected with time which endures, and this connection shows, by the equality of their measurements, their quantitative identity.

We have cited several applications which show some harmony among the laws and principles governing atomic microcosms and the microcosm of the universe. But the similarities thus discovered cannot be developed beyond the very strict conditions which we have indicated, and their interest is thus limited to certain narrow fields of physics. It is not in this direction, but rather in the field of biology, that the most impressive extension of the quantic world has been produced within our familiar classical universe. In life, as a matter of fact, one encounters bodies which, despite their large dimensions, present a structure relating them very closely to atoms and molecules. Crystals, in which certain characteristics of very large molecules can be recognized, but which have neither individuality nor definite limits and which do not constitute closed microcosms, have often been cited as an example. On the other hand, the very large organic molecules conserve their nature while attaining dimensions whose form the new instruments of electronic physics are making ac-

cessible to our eyes. This is the case with viruses and bacteriophagi, whose molecular quality is hardly in doubt; it is also the case with genes and perhaps even with entire chromosomes—or at least with their central chain. Through their relation of development, living beings of great size whose anatomy and physiology are governed by the genes of their cells, and finally man himself, are directly linked to the molecular world.

But let us examine more closely the meaning of this extension and what may be deduced from it as far as the time and the movement in living organisms is concerned. Let us return to the characteristics we attributed to atoms and molecules: transposed to the level of life, they show us the elementary organisms—viruses, phages, genes—as constituting definite chemical species, all of whose representatives are identical and inalterable, hence without memory, and which change only to disintegrate or to pass by a single leap to another species. Delimited units in space and time, though potentially eternal, they are not subject to entropic evolution. Some of these characteristics are indeed those of living beings: their species are maintained and transformed only by discontinuous passages from one to another; the individuals themselves are maintained for some time in their complexity, thus resisting the progressive disorganization imposed by thermodynamic movement. But does life not consist of continual change? Do not monocellular organisms themselves show the presence of memory? Far from being fixed in a perpetual present,⁶ they are drawn by the arrow of time, without return, from birth to death.

These opposing points of view can be reconciled only if one recognizes the double nature of living organisms, that is, if one places them at the same time in the permanent molecular present and in the passing flow of statistical movement. The material supports of these two natures are physically distinct from each other, but they are also indissolubly linked one to the other. Some, guardians of permanence and carriers of heredity, are true large-size molecules, possessing among their catalytic chemical functions⁷ that of identical catalysis or self-reproduction. The others constitute a transforming physicochemical machine of energy and entropy, but a machine which functions blindly and is inevitably halted, no matter how well regulated it may be, and sooner or later falls into chaos.⁸

6. Perpetual in the sense as secretaries of the Académie Française, that is, as long as it continues.

7. It must be a question of catalysis, the only chemical function which leaves its operator unchanged.

8. Which justifies the biological adage: There is no living matter; there are only living organisms.

Two Times, Three Movements

The molecule is in principle eternal, and it is possible that certain of the genes present in the beings surrounding us are the very ones which were included in beings of the same species living a million years ago. More precisely, there is no sense in asking whether they are the same or others, since they are indistinguishable. The machine may also be perpetuated, but, like Jeannot's knife, only by the continual replacement of worn-out parts. This may of course preserve for it an appearance of identity, though quite a different identity from that of the molecule of which it is but the reflection. By its functioning, the machine maintains around the molecule the very condition of its perpetuity, that is to say, it delays as long as possible the final catastrophe which will win out over its present and will disintegrate it. The virtue of the molecule is stability (with the motto: "I stand fast"), while the function of the machine is metabolism (with the motto: "I serve").

In order that this association of the blind machine and the paralytic molecule may endure and draw all the advantages from the two times and from the two movements in which it participates, two conditions are necessary. On the one hand, the machine must receive food for its functioning in order to realize the metabolisms it commands—and this may be sunlight or complex chemical substances prepared by the activity of other organisms, which will assure its continuance from day to day. On the other hand, the molecule may disappear accidentally, causing the definitive ending of the species if it had been unique. Only the property of identical multiplication (or autocatalysis) can give it a character of plurality wide enough for the population thus created to have a chance for some of its members to escape a catastrophe which always threatens an offensive return to chaos.

Without any pretense of reaching an explanation of life, we have sought its place in the universe. We have located it, at the boundary between the molecular world and the thermodynamic world, participating in the two movements and extending into the two times. Perhaps we may be permitted to draw several further consequences from that situation, before venturing forth on the terrain of evolution. The idea of the double nature of life may in fact be generalized to its superior manifestations, which leads us to perceive among beings of large size some cells or tissues devoted to the one function and others to the second. Thus the "present" may be found in the states of consciousness of our brain. Even if of short duration, this present could not be reduced to an infinitely short contact between a past and a future—neither of which exists in fact

within a time which passes in continuous fashion. On the other hand, the flow of time "as an arrow" inscribes its marks in our memory, in our growth, in our aging. Finally, the extreme point of consciousness, this indivisible and unalterable "I" so long as it endures, this simple unity which persists through events and for which memories constitute only a context surrounding it, this little flame seen by D'Annunzio to shine, calm and constant, at the bottom of a well of darkness for an instant of respite in the whirlpool of revolutions, do we not feel that it realizes in us that provisional eternity of the atom whose only property is existence?

Let us go still farther. Do not the societies of men also show this attraction toward two modes of life, examples of which may be found in the historic duration of happy peoples or monastic communities—with laws forming a permanent and unchanging whole—or on the contrary in the changing and adventurous lives of conquerors, prophets, and revolutionaries? The philosophies of Parmenides and Heraclitus, the Yin and the Yang of the Chinese, are reflections of these two tendencies. Religions themselves have not failed to create symbols corresponding to them, some seeing the world as regulated by a total and immovable law, forming a wheel which turns without moving forward or an infernal cycle which must be broken in order to achieve freedom; others seeing in the world the meeting of two principles and a long struggle with various ups and downs, a fatal march toward an end now foreseeable and for which active preparations must be made. Buddhism and Manichaeism, religions of contemplation and religions of salvation—the rule and the century, grace and works. But these are extremes; for life, as we have seen, necessarily wears a double face.

Two times, commanding two movements, with man taking part in both. But is there not a third movement which escapes these categories? Living species do not remain the same indefinitely, protected by their genetic molecules. We see them not only resisting the force which drags them toward chaos but even reversing the movement by becoming more and more complicated. The same evolution from the simple to the complex appears in the ideas of men, in their artistic or industrial achievements.

No doubt such changes can be identified with "movements" of the same type as the material movements inscribed in the framework of the second principle of thermodynamics, but we have already called "movement" the temporal infrastructure of the interior laws of atoms, while we are assured that there, too, it is not a question of the displacement of

Two Times, Three Movements

material objects in the usual sense of the term. Here, in this third movement, one might say that it is "forms" which are mobile, since one sees in successive epochs the same organic matter occupying structures more and more delicately organized. The use of the term "movement" is justified by the fact that we are concerned with variations in time. Besides, these variations respect a principle of contiguity, since one form gives birth to another, and so on, by small, successive modifications.

To render our symbolism more exact and Cartesian, we can imagine a space of forms⁹ in which one point would correspond to a certain complex structure, for example, to a chromosome or a virus. The evolution of a phylogenetic animal line would then be represented by a series of points tracing a trajectory through that space. The points symbolizing the successive fauna of the globe would be displaced by small stages from one region to another of the space of forms.

If we apply such considerations to a material mass, isolated and not living, containing, that is, no animal or vegetable organism, we shall see the representative points of the structures present moving toward the regions of the space of forms which include systems more and more disordered and statistically simple. That is in effect the evolution required by the principle of disorganization, the principle of increasing entropy. If we now imagined that our mass of matter received from an external source a flow of free energy (or of negative entropy), the second principle will no longer be opposed to order's maintaining itself, and even growing, in that material mass on condition that it retain at least temporarily a part of this flow. Structures of increasing complexity can then appear and be conserved; for example, molecular structures of important dimensions. Calculation indicates, however, that the forms thus realized will not be very complex. A priori probabilities of the appearance of each of these forms are in fact approximately equal, of equal complexity, and the number of possibilities increases in an excessively rapid way with the complexity. This, by the way, agrees with the observations which have been made by submitting contexts properly constituted to ultraviolet rays or to electrical emanations. Quite varied organic combinations appear in these contexts but their complexity seldom passes certain limits. If the context contains the necessary nitrogen, carbon, hydrogen, and oxygen, the compounds produced under the influence of the electric current may include amino acids, groups characteristic of the constitution of proteins.

The conditions thus realized are, however, extremely favorable to the

9. A hyperspace having obviously a large number of dimensions.

production of complex groupings, requiring a considerable consumption of free energy. These groupings, called "endothermic," are those which appear at high temperature and under high pressure; but their existence is then very precarious, since the violent molecular shocks which brought about their formation demolish them just as rapidly. To the contrary, in the experiment described here the temperature is low (the normal temperature on our globe), so that, if the free energy which is brought by solar radiation or the electrical emanation produces syntheses of complex molecules, the latter are then conserved (as in a refrigerator) and not demolished immediately by thermic shocks. As, on the other hand, the density of matter is great, the concentration of complex endothermic molecules may become as important as it would be at very high temperature and pressure, but with an individual duration of existence infinitely longer. There is thus constituted a context entirely abnormal at an ordinary temperature, containing in great number these endothermic groups created by radiation and conserved by cold. These molecules turn in upon themselves and take, wherever they may be transported (particularly in the shelter of the rays which caused their birth and which might also destroy them), a reserve of negative entropy ready to work anew in the course of various chemical reactions. The Bordeaux wine of which Mauriac speaks then really carries within its substance the brilliance of past summers. But, let us repeat, without life this chemical evolution of direct products of sunlight is short lived and rapidly leads back to simple compounds, stable at ordinary temperatures. The picture changes profoundly if a living form is introduced into the context under consideration; the variety of substances is not increased, but the quantity in which certain of them are present does increase tremendously. Can it be said that such an evolution is contrary to the principle of increasing entropy? Certainly not if one evaluates, quantitatively as it were, the importance of the structuring of the context being studied. There is actually no reason to think that the total negative entropy of the system is not entirely explained at each instant by the portion of the flow, from the outside, which is there retained. It is in the structural composition of the context that the true difference is found. In the first case, without any living being, the tableau of substances present included a large number of molecules of little complexity which were continually transformed so as to occupy in the course of time all possible places. In the second case, in the presence of the germ, there appears in the picture a group of substances whose complexity becomes very great but which are well defined in number and no longer

Two Times, Three Movements

vary with time.¹⁰ The picture thus constituted undergoes no more important variations thereafter, at least not unless the duration of the observations extends to very considerable periods of time. In this last case, as a matter of fact, we would witness the appearance of new groups of complex substances and on the whole an evolution attaining, step by step, higher and higher levels of organization. However, it must not be thought that the "secular" modifications of the picture would represent a systematic advance only toward higher complexities, for a great number of new groups of less-organized substances would also appear at the same time as the very complex bodies. Indeed, it is rather a sort of "oil-spot" invasion of the whole of the picture that this evolution should bring to mind.

We are thus in the presence of two spreading movements representing the progressive occupation of a tableau of possibilities by reality. In order to perceive the differences more clearly, let us begin with a simple structure, practically homogeneous, and introduce into it a flow of free energy, that is, of negative entropy. In the non-living case the structure is going to tend toward more complex states, made possible by the inflow of free energy, but this extension is made in a total movement, touching one by one *all* the possible complex states, deriving one from the other, and is soon lost in the sands of the immensity of realizable combinations without reaching forms of high complexity.¹¹

In the living case the extension is made under the action of the same motor force, toward the same possibilities, but channeled along particular lines, so that the notion of "choice" is imposed upon us. By the very fact of that channelization, the movement of extension, limited in its diffusion, attains regions farther removed from the point of departure, more highly ordered, more complex. Never, however, at any moment, is the principle of entropy violated by the system under consideration, for the flow entering has always been very largely sufficient to compensate for the increase of order.¹²

Here, then, lies the crux of the problem—there is choice; certain combinations are favored at the expense of others, also possible, but unrealized.

10. At the same time the number of molecules of small complexity diminishes; they are in effect consumed in the course of the synthesis of more complex groupings, to which they bring the necessary negative entropy.

11. This is most probably, however, the way in which, for the first time on earth, an *autoreproductive* molecule, initial germ of all life, was produced. But a billion or two years of waiting were perhaps required for that chance to occur once. And perhaps also certain favorable circumstances aided, of which we shall speak further.

12. In fact, this passing flow may represent, millions of times, the order retained by the context under the form of organic complexity.

This choice on the molecular scale inevitably brings to mind that which Maxwell's Demon was supposed to make between rapid and slow molecules. However, an essential difference separates these two kinds of choice: in the case of Maxwell's Demon, the question was to escape to the second principle in the achievement of negative entropy, of order. And the paradox is resolved when it is perceived that the Demon—who keeps in custody the mechanism which opens or closes the door to the molecules—must receive from each molecule that approaches information relative to its speed, which is costly from the entropic point of view and which offsets, thus, the gain resulting from the choice of the rapid molecules. Here we are supposed to work within an excess of free energy—a wave of negative entropy which will be finally lost but which may be retained for a time by chemical mechanisms. The non-living context itself, thanks to molecular stability, already conserved a little of this *richesse* seized in passage, but without according any privilege to certain forms rather than to others. Let us enumerate several of the mechanisms by which negative entropy (or, again, complexity, order, improbability) stored in endothermic compounds resulting from solar action can emigrate into molecules still much more complex. One such mechanism is that of catalysis. Certain bodies, called "catalytic," facilitate the obtaining of the products of certain chemical reactions by favoring them over others. But this is merely a matter of increased speed for the privileged reactions, and the end product does not differ from that which would be obtained in the absence of the catalyst after a delay of sufficient length—a time which may, by the way, be extremely long. The catalysts often present a structure very similar to that of the bodies whose production they facilitate. In the extreme case, the most interesting for us, the catalyst determines the appearance of molecules identical to its own. It is then a self-catalyzer, or a self-reproducing molecule.

But the simple catalyst plays no "entropic"—or energetic—role, since it facilitates specific reactions to which it is adapted in *both directions* and is found, after the operation, in its initial state. Certain of the bodies produced may, however, be much higher in the scale of complex forms than any one of the bodies at the beginning of the process, on condition that among the latter there are enough which *regress* on that scale during the reaction, thus furnishing to others a supplement of negative entropy which permits them a compensatory *rise*. The catalyst then plays exactly the role of a "machine" like those which make possible the transfer of usable energy from a chemical mixture (air and gasoline) to a mechanical

Two Times, Three Movements

system (automobile) with as small a loss as possible. Here the chemical machine realizes the coupling between "exothermic" reactions which regress in the entropic scale and liberate usable energy and "endothermic" reactions which consume it. Self-reproduction of large living molecules is no doubt based on such a mechanism. Radiation from the sun (and consequently its high temperature compared to that of the earth) is always the source of the negative entropy which we recognize in all these transformations. And the end products may finally be of an order of complexity which could in no way be realized in the sun itself, because they would not benefit from that *thermic tranquillity* which they enjoyed on the earth.

To summarize, we can see how favored lines of development are, in some way, "cut out" in the table of the forms made possible by the supply of negative entropy coming from the sun. This cutting-out, which may present multiple ramifications, is determined by the catalyses and the transfers, following certain structural laws of organic chemistry, as well as by the play of natural selection among living beings which correspond to the complex molecules of the table. We shall make no attempt here to enter into the mechanism of this determination, being satisfied to consider it as conceivable. The extension of real forms in this "structured" table then no longer escapes our principles, and we find ourselves facing our third movement, that of the evolution of beings (and of ideas) with the *start of an interpretation*.¹³

We must be content, then, to ask the great questions again—with, perhaps, some more definite elements on hand—in an effort to approach the solution. Time is no longer that continuous entity, safe from attack, where one could not place even our little human present, since it found itself immediately crushed between the immense voids of the past and the future. There are true presents which introduce structures into this time; and, however great the apparent difference to us between atomic systems and our minds, this at least opens a way toward the analysis of time such as we live it. Existence, in these "beads" of present time, of times which differ by their quality from that which flows by carrying them off, but which are quantitatively in harmony with it, thus doubtless leads to a parallel distinction between the systems subject to these two sorts of time. The movements produced there, differing in their profound natures, are also in har-

13. This interpretation may be found quite insufficient to satisfy our minds. Or, rather, it might be satisfactory from the qualitative point of view—for everything we see around us figures in the table of possibilities—but not from the quantitative point of view. In fact, certain of the combinations of this table, very particular, therefore highly improbable, are present in great numbers—while billions of others, often more probable *a priori*, are absent.

mony at their frontiers through that essential correspondence so closely recalling the pre-established harmony of Leibniz. The stability of these monads, perfect as long as it lasts, no doubt justifies the recognition of their quality as *existing things*, secure in a universe with continuous laws—which itself can be only in instantaneous fashion.

But, in all this, life is still lacking. It is then that the third movement comes into play.¹⁴ This “ascending” movement is produced within continuous time, but it is based on discontinuous existing things. There can be evolution—creative evolution—only thanks to this dualism which gives solid footing to each of the tiny steps staking out the extension of *realized* forms throughout the domain of *possible* forms. The motive force of this movement? We know it; there can be no other than the sun. Its direction? We have analyzed several of its mechanisms—catalysis, transfers, selection—surely there are others which science will discover step by step. No doubt a more subtle principle than that of entropy will one day give us views profound enough to satisfy our thirst for a “sufficient reason.” This principle may perhaps be based on the notion of form, more refined than that of order, on which all our hopes have rested so far.

14. The three movements might be symbolized by the play of water under the effects of gravity and wind. In a lake, under a calm surface, inner currents can stir the surface eternally without any change in its future. An opening in the surface suddenly precipitates it into disorder without return, in the bed of a torrent. But along comes the wind, and the waves it creates strike rocks, breaking into droplets, rising always higher and higher.

EARLY CHRISTIANITY:

ARTS AND SOUL

Both late pagan and early Christian expression may be considered subdivisions of some larger whole—call it the Style of Gnosis. Both are embraced in the earthly gloom and the search beyond gloom for transcendent form. As we look back on the larger motion, it seems inevitable that a faith should have grown from that world hunger. That it would be mystical is also clear. Material Rome was a Lazarus beyond even Christian revival. The faith must be one that could outlive Rome reading in its fall the divine purpose. It must be a faith beyond this life, since this life grew darker from year to year. It must give man what he searched for, a will and power to suffer and die, to meet loss and martyrdom, not in frenzied struggle, but in peace. It must give order to a new society, incorporating the somber Stoic morality in a group-righteousness of love, attended with all the promises of the immortality cults.

With the Stoics religion had remained questioning, burdened with the weight of doubt and the cloud of reason. So Marcus Aurelius:

If indeed there are no Gods, or if they do not concern themselves with the affairs of men . . . [ii. 11]. If souls outlive their bodies, how does the air contain them from times everlasting? [iv. 21]. Things are . . . so wrapped up in mystery that . . . even the Stoics find them hard to comprehend [v. 10]. And the poor soul

itself is an exhalation from the blood . . . [v. 33]. What bathing is when thou thinkest of it—oil, sweat, filth, greasy water, everything revolting—such is every part of life and every object we meet with [viii. 24].

Most of the oriental mysteries, so far as we may judge of them, were tumors that rose in the flesh of late empire, giving the world-weary a jag of excitement, without requiring devotional transformation of the whole life. No doubt every overripe civilization leans to such pseudo-religious cults, pandering to the lechery of self. Neo-Platonism was rich and beautiful, but for intellectuals only, and, like Stocism, burdened with the cloud of reason.

All of these shared the quest; it is only that Christianity discovered the profoundest way of realizing it, of filling the accepted dark with mysterious light. It absorbed the whole man, broke down the introspective selfhood—in Augustine's phrase, *abyssus humanae conscientiae* ("the abyss of conscious personality")—which sophisticated culture had fostered. Doubt is swallowed in a surety of disciplined love.

The outward appearance in the pagan world is, of course, abandonment, madness, folly, and crime. The fact is that when forms are exhausted they must be renewed in something larger. The cure must be radical; it amounts to symbolic death and palingenesis. By whatever deeper genius guides the spiritual motion of groups and cultures, shaping the unplanned and unplannable response (for if it were planned it would not be believed; it would not come as an answer to the human need), the Christians hit on the paradoxical truth (classical thought and rationalism having avoided paradox) that he who would find his life must give it, that the road to self-command was self-surrender, and that those who would discover deeper reason must abandon reason altogether, becoming like children and fools. It is this lowliness, surrender, and drunkenness of early Christianity that gives it a strange ambivalence, a hard external shell of bigotry and dogmatic zeal, carrying the vital kernel of wisdom, humanity, Christlike love.

There are few works of art which show this rare complex of shadow and light in Christianity before Constantine. The best that has so far come to light is probably the head of a prophet from a tomb in the Viale Manzoni, Rome (ca. A.D. 240)—one of the most somberly beautiful heads in the scope of art. It is interesting to place it beside that bust of the virtuous but ineffectual emperor, Alexander Severus, its near-contemporary. Both move in the same darkness. That is the common heritage of the age

Early Christianity: Arts and Soul

of Gnosis. But where the Alexander, for all its gentle soulfulness, is blindly groping through the stew of personality, searching, as Augustine described his own pre-Christian phase, "with a proud dejectedness and untired weariness" ("superba deiectione et inquieta lassitudine"), the other, in its very shadow, has found. It has the calm of moral ordering. In its somber wisdom the joy of faith is renewed. We seem to hear the anticipation of Augustine's later voice, as he considered tottering Rome: "Two cities have been formed by two loves: the earthly by the love of self, even to the contempt of God; the heavenly by the love of God, even to the contempt of self. . . ." The one lifts up its head in its own glory; the other says to its God, "Thou art my glory, and the lifter-up of mine head." If the earthly kingdom should fail, what then; for the Kingdom of God shall "be eternal, and we shall be assured of its eternity; and thus the peace of this blessedness and the blessedness of this peace shall be the supreme good." And as Augustine's heavenly city gathers up Neo-Platonism and transforms it, so the Viale Marzoni head incorporates the Zeus-type of Greek art in a Christian vision. The earliest Ambrosian and Gregorian chant, which was in process of formation throughout this period, similarly inherits late-classical richness of form with the earthly shadow, which it irradiates with mystical light.

Of course, as we have implied, this Augustinian peace did not come without cost, not only of Stoical darkness, the pessimism of the world, which it accepts and spiritually redeems, but of the harsh shell of intolerance as well, in which the germ of love and humanity rode and which doubtless protected it through a violent time and brought Christianity out triumphant over its competitors. From the very nature of the human paradox this dogmatic stamp of authority springs up with the Christian dedication and the resigned humility it requires. So Paul, who closes the Letter to the Galatians with such phrases as these: "Thou shalt love thy neighbor as thyself"; "If a man be overtaken in any trespass . . . restore such a one in a spirit of meekness"; "Let us work that which is good toward all men"; "Far be it from me to glory, save in the cross of our lord Jesus-Christ," opens it with a curse on divergence from his gospel: "But though we, or an angel from heaven, should preach unto you any gospel other than that which we preached unto you, let him be anathema."

How much more, then, does this harshness emerge when the early Christians who paid for their unworldliness at a proportionate price are succeeded by wealthy bishops, who fought for the lucrative tax-exempt positions of the church and, installed in them, gave Christian blessing to

everything Christ himself had condemned. We witness just such an organizing reversal as has occurred time and again in the history of revolutions. Tender humility fortifies itself in intolerant pride, and this is in keeping with the whole dilemma by which a religion, supposedly of poverty and self-sacrificing love, found itself, in the first place, in the real world at all, and, second, made mistress of the Roman state, owner of African slaves and land, protectress of empire and scourge of the infidel.

It was doubtless the breakdown of all traditioned sanctities of senate and emperor under the military tyranny (which came in waves each worse than the one before, cresting after the death of Alexander Severus) that enforced the need of some new divinity to hedge the emperor, elevating him above the Praetorian rabble whose puppet he so easily became. The result after the reforms of Diocletian was Constantine's establishment of the Caesar as oriental demigod in Christian guise, the divinely appointed king, chosen vessel of God. This solution expresses the age, its humanistic abandonment, the removal into mystery, out of time. The emperor puts off the human toga of Roman citizen and leader of the senate, in which Augustus had robed despotism, and which other rulers down to Severus had, as Gibbon says, "decently preserved." Faith now becomes the key to power, and history takes the spaceless form of a symbolic encounter between spiritual legions.

The impact of this change is startling, if we recall the histories of the Greeks, or even of the Romans, and then turn to the *Life of Constantine*, written by Eusebius (ca. 263-ca. 339), his at first hostile churchman. Constantine's armies march under the banner of the symbolic cross. Against this sign the demonic forces array themselves, led by the Roman Maxentius, who puts forth all his sorcery: "sometimes for magic purposes ripping up women with child, at other times searching into the bowels of newborn infants. He slew lions also, and practiced certain horrid arts for evoking demons." But it is in vain. The biblical prototypes suggest the issues; as Pharaoh and his chariots went down into the sea, Maxentius and his guards, put to flight, are drowned in a river, and Constantine erects in Rome a triumphal statue of himself bearing a spear in the shape of a cross:

By virtue of this Salutory sign, which is the true test of valor, I have preserved and liberated your city from the yoke of tyranny. I have also set at liberty the Roman senate and people, and restored them to their ancient distinction and splendor.

Early Christianity: Arts and Soul

The history of the Middle Ages and Renaissance is heralded. A mystical Christianity espouses the antithetical freedom and glory of pagan Rome.

It is thought that Eusebius was a native of Palestine; he was certainly educated there, under a disciple of Origen. The style of thought and narrative betrays its source. This is biblical history—miraculous, careless of cause and effect, time or place. It moves in another realm, which has been conquered by the "Salutary sign."

Finally, in the third book of Eusebius' *Life of Constantine*, with the account of the Council of Nicaea (A.D. 325) we reach a climax in the sanctification of force. It is what comes to characterize the Eastern Church, where spiritual power is united with temporal. Here humility toward God—"with regard to his mind, it was evident that he was distinguished by piety and godly fear"—parades in an exterior of regal pomp (*ibid.* iii. 10):

And now, all rising at the signal which indicated the emperor's entrance, at last he himself proceeded through the midst of the assembly, like some heavenly messenger of God, clothed in raiment which glittered as it were with rays of light, reflecting the glowing radiance of a purple robe, and adorned with the brilliant splendor of gold and precious stones.

This is the imperial heaven which glistens two centuries later from the gold mosaics of Ravenna's walls. But the supreme reversal of Christ's own values follows in the fifteenth chapter:

Detachments of the bodyguard and other troops surrounded the entrance of the palace with drawn swords, and through the midst of those the men of God proceeded without fear into the innermost of the imperial apartments, in which some were the emperor's own companions at table, while others reclined on couches arranged on either side. One might have thought that a picture of Christ's kingdom was thus shadowed forth, and a dream rather than reality.

Various works of art show this holy hardening and militant canonization. The colossal bronze of Constantine would serve; but more cruelly expressive is that of his heretical son, Constantius II (*ca.* A.D. 360), in the Conservatori in Rome. It may stand as a portal to the sinister aisle of Dark Age religion—the scourge of mortal man's believing that he comprehends and represents the divine will. And hand in hand with the inner life the outward form has been dogmatized, stylized into symbolic ritual, a surrender to the primitive; in terms of technique the wheel of the classical world has come full circle, back to the geometric and angular with which the sixth century B.C. began, the immersion of personality in transpersonal cult. But the return is also a leap to a new mode on the organizing scale. The

abstract asperity of this face—the eyes rolled upward in a piety stripped of earthly and humanistic shading—is a mirror of the savagery practiced under the curtain of faith; both are symptoms of a declining state, overrun by barbarians from without; within, hardening socially to the feudal frame, mentally to the hierarchy of superrational dogma. Yet under all this, as in the primitive return of Constantius' face, the new personality is smoldering, the visionary self and world, latent in the eyes, cruelly advancing in the hard mask of bronze. Even here the germ of advance, like a crab, retrogresses forward.

It was this Constantius II who made the terror of Christian piety so plain that the forlorn effort of Julian (331-63) to restore the liberal worship of the pagan gods was a natural consequence. But, if this is a testament to Christian intolerance, it is equally so to the blindness of Julian, who thus dreamed that a rational relativism, which even when alive had been unable to maintain itself, could now be resuscitated from death by an act of will.

As we consider the first abuses of official Roman Christianity, it might seem the sincere message of Christ was done for, discredited forever. But these were manifestations only of what zeal had implied from the first, but had compensated for with another life, which was still stirring in the shell. Christianity was as subtly constructed as any evolving vitality. It bore the means of its own regeneration, its successive and purifying reform.

Christian love and humility, as they aim at an ideal limit, manifest themselves in the tension of matter only as coupled with and in the strength of their opposite, arrogance and self-seeking, individually or socially. Thus the medieval ascetic, who approached surprisingly near the aim of self-denial, did so by virtue of existing in the Catholic frame, an organization strenuously devoted to its own welfare. So, in the fourth and fifth centuries, under the now secure protection of a dominant church, the ascetic and mystical spirit in Christianity might retire to meditation or the wilderness, drawing to a specialized core which poured soul into the organism of the whole as the militant and grasping members sustained it. Monasticism, the extreme of this, growing—with the church consolidation—from its beginnings in Anthony of Egypt (250-350) toward its Italian codification under Benedict (450-543), became a burning heart in the antithetical and supporting frame.

But everywhere there were stirrings of apostolic earnestness, tempered by Christian humanity, working through the zealous forms of such an age. The giants of this aspiring were the Latin Fathers: Ambrose, Jerome, Augustine, and Gregory. It is they who direct the rescue of the spirit from

Early Christianity: Arts and Soul

bondage to the militant body, the Constantinian state. The letters of St. Ambrose (ca. 339-97) to Valentinian II and Theodosius are the spearhead of the struggle, especially his rebuke to the latter after the punitive massacre in Thessalonica (written ca. 390): "I prefer God to my sovereign," and, "if you purpose being present, I dare not offer the Sacrifice." The Christian message prevailed; the emperor confessed his guilt and was readmitted to the communion only as a repentant sinner. It would be hard to assess how far Western individuality, as it later developed, was dependent on this opposition and tensile independence of church and state, or to judge how far their monolithic conjunction in the East was correlated with its suppression of individuality. In one sense, therefore, Ambrose's action (curious he should have been born in the French-German city of Trier) was causal, though in another sense it is only symptomatic of the Western trend, as it was already differentiating itself from that of the East.

Just as one might have thought, the true spirit of Christianity was smothered under the official basilica of Constantine—and would have misjudged—so the bronze statue of Constantius II might lead to the assumption that by 360 the Dark Ages had already fallen, that the rich personality and harmony of the classical world had been thrown down by "A shape with lion body and the head of a man, / A gaze blank and pitiless as the sun" (Yeats, "The Second Coming"). But that fear would also have proved premature. For it was just under the Dominate restoration of order, down to the formal extinction of the Western Empire in 476, that the Christian arts enjoyed a last rich harvest. Both faith and style restore themselves in a literature, art, and music of supreme depth and beauty.

If the acceptance of earthly darkness and preoccupation with spiritual light gives the Roman-Christian flowering much in common with the Dark Ages for which it sets the forms, and even with the Western medieval, there is this difference—that where the twelfth-century Romanesque is emerging from the bareness of the primitive and ascetic, irradiated from the future by the first rays of unconscious humanistic morning, the Roman Christian is suffused from the past by the twilight gold of the pagan world.

If primitive art is that in which individuality, with all its elaboration of personal mood, meditation, feeling, heart, does not freely appear—tending rather to hereditary suppression under the communal canons of cult—then classical Gregorian chant, with Augustine and the earliest mosaics of Ravenna, while on the voluntary road to primitive submission, have not

by any means arrived there. This is not merely because they are technically elaborate. The canons of primitive art in themselves may be remarkably complex; but it is by virtue of an impersonal bareness, a stripping-off of the atmospheric modulations of a civilized age, that we call such an art "primitive." The rhythms of African music, Moorish linear design, Celtic illumination, geometric pottery, the Medieval Sequence, have formal aspects in which they are beyond sophistication; yet, when contrasted with productions of ripest individuality—Tel Amarna art, Chinese landscapes, Greco-Roman thought and poetry, the quartets of Beethoven or Goethe's *Faust*—we sense the primitiveness of spirit.

It is just this primitiveness that the classical Christian arts have not yet stripped themselves to, though they steadily approach that condition, as the contrast of Augustine (354-430) with Gregory (540-604) would imply. Indeed, Augustine's own development from the *Confessions* (398) to *The City of God* or his increasing canonization of contemporary miracle (contrast the complaint in the *Confessions* that miracles do not exist in our time with his official promulgation of miracles reported in 428 in connection with the transporting of Stephen's bones) may indicate such a trend. In the supreme works of the age, however—the *Confessions*, the contemporary Ambrosian and Roman chant, the early basilicas of Rome and Ravenna—not only is the form subtle and refined but it retains from its classical home a rounded richness and meditative crepuscularity. This is particularly true of the Augustine, which gathers up the entire Greco-Roman evolution of consciousness and gives it a new introspective depth and self-awareness. Personality as such, it is true, is here merged in the common faith and worship, but there is still the sense of an individual who knowingly surrenders himself and in that act plumbs unexplored mysteries of inner being. By the tenth century this awareness has largely disappeared; the surrender of personality is an automatic condition of the primitive life and creed; consciousness has withdrawn to that latent and ineradicable core—the germ of later advance—the private soul before its God.

The earliest body of music which is generally known and admired today is Gregorian chant, named for the sixth-century pope who gathered it together. It is not alone the still-accepted plainsong of the Catholic church but constitutes one of the great art monuments of all time. It must be observed, however, that we know it only by modern reconstruction. The traditional performances obviously changed throughout the Middle Ages and in the post-Renaissance grew much degraded. It is largely as revived by the theorists and monks of Solesmes Abbey that we hear it

Early Christianity: Arts and Soul

today. They began their work of purification and recapture in the nineteenth century, and considerable dispute has arisen about interpreting the rhythm. The various theories are reviewed by Gustav Reese.¹ The heart of the disagreement seems to be that the Solesmes school holds all notes of equal value, where the mensuralists assert that in the classical period notes were long and short and that only after the rise of polyphony (eleventh and twelfth centuries) were all notes assimilated to an equal length for ease of polyphonic performance. This would seem to relegate Solesmes Gregorian to the Middle Ages rather than to the Roman Christian period. Where the truth lies cannot at present be resolved; so that all plainsong, as now sung, is subject to the distortions and *Zeitgeist* modifications we note in any half-certain effort at restoration, as in Viollet-le-Duc's Gothic, of the like. Of one thing, though, we may be sure. The Solesmes interpretation, while in the matter of note lengths it *may* conform to a later period, is aesthetically unlike whatever plainsong must have existed in the twelfth century and afterward. It is consciously reconstructed in the Roman-Christian spirit, and, in the absence of any satisfactory, much less beautiful, performances by the mensuralists (who disagree much among themselves), the Solesmes recordings must be taken as the best existing (though necessarily provisional) realization of Classical Christian chant.

As such, it has melodious roundness and subtle flow of rhythm which were the classical heritage; in the long caressing phrases the religious dedication of Hebrew and Eastern ritual mixes with the modulations of Greece and Rome. Though it celebrates a spiritual withdrawal, the duality of earthly decay and faith outside time, it does so in a lingering ripeness of earthly form. This is the condition also of fifth-century mosaics and illuminations (the Orphic Shepherd Christ in Ravenna, or the "illusionistic" Vienna Genesis, probably of the school of Antioch); in fact, it is the very substance of early Christianity, where the new faith builds on the quiet ease of patrician culture. Thus Augustine retires for meditation to the suburban villa of a wealthy friend. The gentle nostalgia of this late classicism (poignantly coupled with mystical faith) is most perfectly represented by that magical passage from the *Confessions* (Book ix, chap. 10), where, shortly before his mother's death, Augustine speaks with her concerning the Kingdom of Heaven:

The day now approaching that she was to depart this life, (which day thou well knewest, though we were not aware of it) it fell out, thyself as I believe, by thine

1. *Music in the Middle Ages* (New York: W. W. Norton Co., 1940), pp. 140 ff.

own secret ways so casting it, that she and I should stand alone leaning in a certain window, which looked into the garden within the house where we now lay, at Ostia by Tiber; where being sequestered from company after the wearisomeness of a long journey, we were recruiting ourselves for a sea voyage. There conferred we hand to hand very sweetly and forgetting those things which are behind, we reach forth unto those things which are before.

Here the mild twilight of Greco-Roman personality is evoked by that single impressionistic touch: "that she and I should stand alone leaning in a certain window"—in which also the symbolic application is caught up and carried along. For this becomes the window—and all earthly life is for Augustine such a window—to what immediately follows, perhaps the most glorious meditation in the entire range of mystical literature; yet not altogether mystical either. Mysticism, too, is subdued under the Neo-Platonic shadow; the highest moment is still a "sighing after." (Typical that this great passage should be derived from Plotinus, from the *Enneads* v. I, 2:)

We said therefore: if to any man the tumults of the flesh be silenced, if fancies of the earth and waters and air be silenced also: if the poles of heaven be silent also: if the very soul be silent to herself, and by not thinking upon self surmount self: if all dreams and imaginary revelations be silenced, every tongue and every sign, if whatsoever is transient be silent to any one—since if any man could hearken unto them, all these say unto him, We created not ourselves, but he that remains to all eternity: if then, having uttered this, they also be then silent (as having raised our ear unto him that made them) and if he speak alone; not by them but by himself, that we may hear his own words; not pronounced by any tongue of flesh, nor by the voice of the angels, nor by the sound of thunder, nor in the dark riddle of a resemblance; but that we may hear him whom we love in these creatures, himself without these (like as we two now strained up ourselves unto it, and in swift thought arrived unto a touch of that eternal wisdom which is over all:—could this exaltation of spirit ever have continued, and all other visions of a far other kind been quite taken away, and this one exaltation should ravish us, and swallow us up, and so wrap up their beholder among these more inward joys, as that his life might be for ever like to this very moment of understanding which we now sighed after: were not this as much as Enter into thy Master's joy? But when shall that be? Shall it be when we shall all rise again, though all shall not be changed?

Here is a truly Gregorian sentence, and, as the Gregorian phrase has behind it the heritage of Greek and Eastern song (or as the mosaic-filled basilicas are built upon centuries of architectural achievement), so on Platonic philosophy and the sure foundation of Ciceronian eloquence rests

Early Christianity: Arts and Soul

the vaulting of this verbal dome. Yet it is an illusionistic vault, which opens within to the dimensionless mosaic of mystery. For it is not in technique alone that the similarity to Gregorian lies; what Augustine speaks of here is precisely what Gregorian more than any other music attempts. Where later Western music dilates and diffuses, breaks us up on the "forms of the earth and waters," Gregorian unifies and converges, abandoning all but the inviolable voice of mystical surrender and immaterial reward. Goethe's dictum, "How few are inspirited by that which speaks only to the spirit," here applies; this is the paradox of Gregorian—that the same expression which seems of all others least varied, most limited and plain, once we give ourselves to be drawn through the single point of its melodic line, transcends the limitation of emotional range, becomes of all music the most hypnotically full.

It is hard to parallel this experience today in the Roman basilicas. The transformations of Renaissance and Baroque have filled them with voluptuous riot. The most impressive at a first glance is St. Paul's outside the Walls, but it is almost entirely a reconstruction and without atmosphere. Far richer, and best preserving its Roman-Christian sanctity, is Santa Sabina, of the fifth century. One can actually hear Gregorian there, and to do so is to stand at another Augustinian opening into that last classical age.

The condition of living and speaking in the inner silence imposes on such art all the limitations of the style of Gnosis, of which worldly shadow, subdued emotion, resignation, with the unobtrusive and indefinable pervasion of triumph are elements. Suppose we climb the Aventine in the spring, the morning of Palm Sunday, say, and at sunrise, from the little park over the Tiber, look out on Rome under the pouring song of the nightingales. Then pass into the church of Santa Sabina. Ethereal light filters through alabaster panes down the antiphonal of columns, the undulation of arches, along the shadowy retreat of aisles; it lingers in the frescoed apse (one must look through Zuccaro's paint to the earlier lines) and reflects as from a liquid in the polished marble of the floor. Imagine the procession of the olives and palms in the cloister, the responsive chanting of the monks within, and the group without knocking at the doors of cypress wood (carved with the Crucifixion [422-32] in a style typically restrained), then the opening of the gate, the divinely lingering cadence of the "Libera me," like a green island of eternity.

Out of the crushing of Rome this peace flowed like honey, serene, without the dramatic contrasts of assertive ego of later religious music, of

Gabrielli and Bach. Suppose we hear the "Christus factus est pro nobis" (Solesmes Album, VM87, face 5). The emotional range is as great as Gregorian allows, a veiled modulation, the tragic opening mitigated by the suavities of prayer, the exultant close restrained by the temporal shadow. It begins: "Christ was made obedient for us unto death, even to the death of the cross." The whole phrase hangs in the silence, the lingering pain which is not pain because it is soothed into acceptance. A pause, and then: "For which God has exalted him and given him a name above all names." It is the resurrection, the leap from the dark. The simple change of range, the faintest shift of figuration: for the solemn drop on "crucis" the insistent pulse and soar of "exaltavit illum"; it is a contrast as subtly mysterious yet as richly moving as that from page to page of the Vienna Genesis: from the dying Jacob blessing his son, back to the scene of Jacob greeting the sunrise, with the strange rosy light on the mountain stones. And any greater shift would be out of place in the amber suffusion of Santa Sabina, at Augustine's sequestered window, or anywhere in the Ausonian dusk of that age.

Mention of Ausonius (ca. 310-95), who was writing into leisured old age at his villa in Bordeaux, reminds us how far this late-classical twilight could retain its pagan spirit, its celebration of warm days in the wine of Gaul:

Quis color ille vadis, seras cum propulit umbras
Hesperus et viridi perfudit monte Mosellam:

Thus opens the poem on the river Moselle, which Rolfe Humphries has translated:

What color are the shallows, now that evening
Moves the late shadows forward, and the river
Is dyed with the green mountain? All the ridges
Swim in the ripple of motion, and the vine
Trembles, and is not there, and under water
Its cluster, seen through glass, is magnified.²

And Helen Wadell, whose *Medieval Latin Lyrics*³ contains another version, in her notes on Ausonius and his pupil Paulinus, gives inspired reminiscences (as if she had lived it herself) of that last walled garden in which pagan and Christian love mingle and contend. She writes:

2. *Poems Collected and New* (New York: Charles Scribner's Sons, 1954), p. 233.

3. London: Constable, 1929.

Early Christianity: Arts and Soul

"The poetical fame of Ausonius," said Gibbon in an acid footnote, "condemns the taste of his age." A good deal of it is sad stuff. . . . But . . . the new romantic imagination working on Virgil, himself romantic enough . . . in the fields of Sorrowful Lovers, from a phrase or two in his original . . . has created the twilight world of Western Europe. . . .

The poem, a literary culmination of the illusionistic tendency which had produced the Odysseus landscapes and was flowing into the Christian miniatures, especially from Alexandria, is this:

SILVA MYRTEA

Errantes silva in magna et sub luce maligna
Inter harundineasque comas gravidumque papaver
Et tacitos sine labe lacus, sine murmure rivos,
Quorum per ripas nebuloso lumine marcent
Fleti, olim regum et puerorum nomina, flores.

She translates:

THE FIELDS OF SORROW

They wander in deep woods, in mournful light,
Amid long reeds and drowsy headed poppies,
And lakes where no wave laps, and voiceless streams,
Upon whose banks in the dim light grow old
Flowers that were once bewailed names of kings.

This is the poet of personality and gentle nostalgia, a luke-warm convert to Christianity, whose favorite pupil, Paulinus, was called from that Callic lingering of Greece and earthly affection into spiritual isolation by the siren of Christian eternity:

Not that they beggared be in mind, or brutes,
That they have chosen their dwelling place afar
In lonely places: but their eyes are turned
To the high stars, the very deep of Truth. . . .
And whatsoever wars on the divine,
At Christ's command and for his love, they hate. . . .

So wrote Paulinus, and then, with a last great but impersonal protest of love, "Ego te per omne quod datum mortalibus et destinatum saeculum est" ("I shall hold thee through all chances and fates"), he withdraws into the silence, the service of St. Felix at Nola: "Spring wakens the birds' voices, but for me My Saint's day is my spring." It is the retreat into spacelessness, the current and motion of the time.

In the mosaics of Rome and Ravenna it is brought visibly before our eyes. Strange, to see a representational art with a long tradition in the life of this world even while retaining its realistic surface become possessed by an entirely non-representational and symbolic spirit: the bodies stiffen and remove themselves from the flux of things; the eyes widen and grow unfathomable (they were sublunar orbs before; now they gaze down from the Empyrean); the colors are spectral, gold and blue veils; the symmetry is final, stylized; nothing is valid in its own right but as it speaks of the known but unknowable divine: the monogram, the lamb, the dove, the throne, the living font and well. Not Christ nor any of his disciples continues as a man; they are caught in the timeless aspect of their being, neither acting nor suffering, yet suffering in a victorious and eternal act—"at the still point of the turning world." Yet all the residual frames of representation remain; and it is a sensation which takes us to the heart of that age to see these haunting eyes (*Head of a Prophet* [sixth century, S. Apollinari Nuovo]) longing as the late Romantic, yet dogmatically resolved, indifferent, cold, implacable, a trifle cruel, and yet none of these precisely, since none of these applies at that remoteness of vision—"an image out of Spiritus Mundi" to see these eyes, of which the very soulfulness is vacancy, gazing from the still lush trappings of imperial technique—this is the unforgettable impact of the developing Byzantine.

It is as if we saw the Christian spirit divesting itself of classical consciousness, preparing for the Dark Age agony, the fallen world, and unquestioning faith beyond—the stripped intensity and paradox of blessing. Augustine in the last Roman flowering had heralded it: the dismantling of the pagan temples to rear the narrowing basilicas of God. A hundred years later, with Gregory, we have crossed the divide:

Soon afterwards the wild nation of the Lombards jumped at our throat and mowed down the inhabitants of that country. The cities have been laid waste, the fortresses destroyed, the churches burned, the monasteries torn down; the fields are abandoned by human beings and without cultivation. . . .

. . . Wild animals have taken possession of places where multitudes of men lived before. I do not know what is happening in other parts of the world, but in this country where we live, the world not only foretells its end but manifestly displays it to our eyes. . . .

. . . Since all temporal possessions have fallen away from us, we must strive with greater eagerness for things that are eternal [*Dialogues*, Book viii (trans. Christian Mackauer)].

This is the rock gorge that lies between Christian antiquity and the Christian West.

DREAMS AND TIME

THE KNOWLEDGE OF DREAMS

Until now, the analysis of dreams has dealt almost exclusively with their contents and has been concerned with an attempt to extract all their meaning from the images which appear in them. As is well known, the incorporation into science of the analysis of dreams began with Freud, who, upon discovering a basic hypothesis or subject, quickly arrived at a kind of metaphysics of which dreams are the manifestation: the libido, which is, in essence, desire.

But, in dealing with the phenomenon of dreams as a part of human life, one must first study their form: the form of the dream, first of all; later, the species of dreams, if such species exist. One must, that is, arrive at a phenomenology of the dream and of dreams. Such a phenomenology does not exhaust the study of dreams; it is simply a first approach to knowledge of dreams, an introduction.

THE PHENOMENOLOGY OF THE DREAM

In the first place, we must make clear the sense in which we are using the term "phenomenology." We mean by it the study of the "phenomenon," and phenomenon is what becomes manifest, what appears. This does not imply, or require, the use of the phenomenological method of Husserl,

Translated by Donald L. Fabian.

because the original meaning of the word "phenomenon" is the one accepted here.

THE PSYCHIC PHENOMENON

The relationship we have with our psyche is immediate. But the psyche is a phenomenon for us, for the knowledge-seeker who is confronted by it as by a reality which is "given." What we ourselves term our soul or "psyche," and what occurs in this soul or psyche, is something that we can know only partially and on certain occasions: in actions which we ourselves have produced, when we have decided to do so, in what is understood to be a "voluntary act," an expression of liberty. But "liberty" and "will" are employed here in the traditionally established sense; hence the use of quotation marks.

Below and beyond those voluntarily determined actions lies the spontaneous life of our psyche, which only in exceptional situations is known to us in an inner way. In this life there are facts and situations entirely unknown to us and which defy our efforts to understand them; they are reality.¹ This reality appears in an especially pure form in dreams. Freud was right about this.

But, in consequence, we must approach an understanding of it by treating it as a reality which is independent of us and which, nevertheless, is most truly "ours," because it is the most immediate and spontaneous kind of reality.

To approach directly the contents of dreams amounts to the same thing as approaching what we receive in the perception of the so-called outer world when only the content of those perceptions is analyzed but not the perception as such; that is, without having constructed a psychology and a phenomenology of perception and without having posed, philosophically, the problem of reality as such. This kind of approach is an attempt to understand the value and meaning of dreams without having first asked one's self about the dream in itself. What are dreams and how do they differ from waking, in which we perceive what has always been understood by the term "reality"? The reality of dreams, however, is an aspect of the phenomenon of our own reality, because in dreams our lives appear as pure phenomena, which we witness. The dream state is the initial state of our lives; we waken from the dream—wakefulness, not dreaming, supervenes. We leave dreaming for wakefulness, not vice versa.

1. "The nature of reality is resistance," says Ortega y Gasset; we accept this idea as a point of departure. Later we shall define other aspects of the nature of reality in terms of time.

Dreams and Time

This is apparent in the growth of the individual from child to adult, in the course of human history, in its successive periods of awakening to consciousness. Dreams are at one and the same time the most spontaneous and the most alien form of our lives; they are the state in which we are farthest from ourselves and freest from intervention. Hence, the ambiguity of dreams.

In dreams we are objects to ourselves. The aspect of our lives which appears in dreams is an object. It is an object because it resists us, because it is independent of us, but, most especially, because we cannot change it. And it is at the same time the most subjective aspect of our lives, since it is spontaneous, pure action without thought, and since everything in it is for us immediate and aproblematical.

This is a state in which the subject-object relationship has not yet appeared; the subject has not yet been differentiated from the object. What, then, is dominant?

This question conjures up two kinds of dreams or two forms of the appearance of dreams, which will be more fully described later. One must first observe that which is characteristic of all dreams—of the very state of dreaming—and why, while the dream state is indeed the primary state, it could never have become the whole form of human life.

OUTLINE OF A PHENOMENOLOGY OF DREAMING

One of the characteristics of dreams is that in them people and even events rapidly give place to others and mingle with them; this brusque shifting has a quality which poetry has always expressed in metaphors derived from dreaming: they *disappear*. But there is something stranger still, and that is that we are not astonished by this process; in dreams we never wonder about anything, and we never stop to think, as we do in reality. In some dreams we follow what happens logically, with a form of reasoning which adapts itself to them; we never dissent from what happens in the dream as we do from the events of reality which we experience during wakefulness. In literature there are works which have a dreamlike quality; these are tragic works, Greek tragedy, for example, or in modern literature works like Kafka's *The Trial* or all the novels of Dostoevski. These works have this dreamlike quality because the protagonists do not wonder and are not astonished; they appear immersed in anguish or in any other state of mind and are at home in these states.

In classical literature such situations are resolved by awakening to reality. In Sophocles' *Oedipus Rex* this happens in a typical fashion when

Oedipus becomes aware of the reality of his situation; he then awakens and tears out his eyes, the organs of sight. That he should do this is by no means a matter of chance. Once awakened, he finds himself thrust outside of life; he is really lifeless, but he has time for . . . anything that may happen. In any event, he has *time*.

The dreamer is not surprised that a figure or an event in a dream should vanish; he is not astonished that figures or dreams should persist monotonously; he is not sufficiently surprised to adopt a questioning attitude. Neither does he feel any concern about the multiplicity of events which occur. But he does not fail to understand them. And if he does become sufficiently surprised to adopt a questioning attitude, he awakens. He awakens not only at moments of great suffering but also at moments of great happiness, and sometimes, in dreams which should be distinguished as possessing special value, when there is an obstacle to overcome, a threshold to cross (a door, steps to climb, a street which is closed off), or when he is only a fraction of an inch from an object which is held out to him and which seems precious to him, and yet that distance cannot be traversed. In dreams we never perform a genuine action in which we overcome an obstacle or find a solution to a problem which has arisen.

To be sure, there are dreams in which a conflict is resolved; but that is precisely the way to describe what happens: the conflict is resolved or appears so, or the solution unexpectedly emerges from a painful situation which has been carried to its limit and emerges in the form of the appearance of some other image. In dreams, then, we are present at a conflict which concerns us, something which is taking place in our presence and which we may or may not feel is related to us, but which never causes us to take action. In dreams we never think, properly speaking, although it may happen that we find the solution for a problem which tortured us when we were awake. But this is not thinking. It is finding; it is being present at a revelation or at a disclosure, but always just being present.

The examination of a series of dreams on the same subject, with the same images in which there is an obstacle, finally overcome, will bring us still closer to the decisive characteristic of dreaming. This, for example, is a dream which recurs: there is a street which is closed off, until, finally, it is thrown open—perhaps someone may appear to guide us. But, on the other hand, there are no dreams in which the protagonist who sees the street become closed to him succeeds, after self-interrogation, the adoption of a questioning attitude, or a moment of thought, in passing through the street.

Dreams and Time

There is no place in dreams for the privileged and exceptional moment, the one moment, set apart from the others, in which we question ourselves or decide for ourselves to do something; this moment of pure activity that represents thinking, desiring. Everything happens as if the dream were determined from the beginning, as if it were a historical fact that had already happened and which can neither be added to nor subtracted from. In short: Time does not exist in dreams. While we are dreaming, we do not possess time. When we awake, time is restored to us.

What we are deprived of during dreams, then, is time. This deprivation occurs in all probability without regard to whether or not the dream is instantaneous; for this dream state can be prolonged in time, during a measurable period of time. And even if the dream takes place in an instant, this fact does not cause us to be deprived of time. What causes this deprivation is the fact that we are not permitted the use of time, we are in time, immersed in it, but unable to use it; we are present in time which has no master. And the consequence of this is the non-appearance of the instant, of that unique, privileged instant—our moment, in which we experience astonishment and wonder, the moment void of any occurrence. The use of time, time in the human sense, arises from a void, from a gap in the flow of time. For in dreaming there is a succession of events, images which disappear and give place to others, but there is not that empty moment which is what causes something actually to happen. When, during waking, we say, "This has happened to me," the fact is that there has been a gap and after it something has happened, and after that another gap, which is what causes the event to become past. Consciousness is what places the events of our lives in the past. If this were not so, all that has happened to us would coexist, continuing to weigh heavily upon us. Whether the dream were a happy one or a sad one would not matter; life would be a nightmare.

The structure of time in dreams is, then, without gaps; it is a compact time into which we cannot enter. So, in a certain sense, we are outside what is happening to us; consciousness does not participate; it is merely present. Consciousness watches what is happening, even if what is happening is the explication of a desire.

The dream world is the world of Parmenides: it is "being," one, identical with itself, without gaps, outside of time. In it the psyche is like the "one" of which Parmenides speaks, "without gaps." But the identity is a pre-identity, since there are events which, paradoxically, take place within the atemporal or pretemporal unity of the dream, of the dream-

quality, or, rather, of the dream-reality. That is why in dreams everything is possible and real. The arrow reaches its target before it has been shot, or never reaches it, and Achilles never catches the tortoise.

Zeno's "aporias," intended to prove the impossibility of motion—that motion is not a part of being—becomes fact in dreams; dreaming, like Parmenides' one, is without gaps. It is for this reason that in dreams everything is either impossible or already exists; everything is or is not, in an absolute way.

Dreaming is the static appearance of life. But since psychic life is, by its very nature, movement, or happening, dreaming is paradoxically the immobilizing of movement, the absolute of movement. This occurs also at the other extreme of human life: in artistic creations, and especially in the art which is more movement than any other, music. Music is organized dreaming—dreaming which, without ceasing to be dreaming, has passed through time and has learned from time, has made use of time. And every successful life (while at the same time remaining basically a dream) has developed in time and made use of time in the process of realizing fully its vocation, love, and knowledge; this is to say, whatever man has created. Human creativity as a process submits to time, passes through time without being destroyed by it, without becoming fragmented in it or controlled by it.

For real human time is the time which shatters the primitive unity of the psychic process, to which outside happenings are subjected as they come into being. What has happened to us during waking enters into the world of dreams, into the basic psyche, experiencing the absence of time, becoming motionless. That is why events which have occurred in different and widely separated circumstances during the life of the dreamer are interrelated; that is why fragments from infancy or from periods far removed from the present appear. For in fact in the psyche, which is timeless, no movement occurs; and what comes from outside contributes to the formation of a single event, fragments of which emerge like monstrosities.

This absence of gaps and of void in the temporal flow, which causes time not to exist as such in dreams, is the inverse of the spatial form of dreams. Empty space in dreaming appears as a place. Every dream takes place in empty space, to such an extent that we might say that spatial emptiness is the natural place for dreams.

In this empty space images float or glide without gravity or weight. And so all the intensity of perception, all the strength of these images, arise

Dreams and Time

from the images themselves, from their mere signification, their mere meaning. During waking many of the things which we perceive would not even be perceived if they were not under the influence of gravity, if we did not realize that they have weight. This emptiness, which is the inverse of the absence of temporal gaps in dreams, is perfectly appropriate to them, since emptiness is actually absence of space.

The fact that movements occur in dreams does not invalidate what has been said. On the contrary, we perceive in this way the nature of the motion which occurs in dreams, a movement which is, so to speak, "pure," without time or space: motion of the thing itself, the motion characteristic of a primary psyche which has no connections with reality, the psyche impermeable to space and time which reveals itself as pure action, not conditioned in any way, free and automatic at one and the same time.

By empty space we mean that space which has no weight or resistance (distance to be traversed), and by space we mean that which has resistance to bodies and movement—a distance to be traversed.

What, then, is the nature of the movements performed in dreams or of those which occur in dreams? They have the nature not of being effected but of motion-being, of developing in apparent motion, in motion-rest, substantial motion, so to speak. Therefore, this movement cannot be changed or corrected. That is why in dreams which contain an obstacle to be overcome, a distance, however brief, to be traversed, the obstacle is not overcome and the distance is not traversed. And if these were to be accomplished, there would be no sense of having performed any action.

For example, an object of any kind, the possession of which is valuable, may appear in a dream to be at a distance from the hand so small as scarcely to be perceptible; when the hand moves to grasp it, the dream vanishes. And the dreamer would probably awaken if there were any desire to seize the object; that is, if the tension which precedes a real movement was present. In dreams nothing can be done; the only action which we are permitted is that of waking, of doing everything possible to wake up.

That is why when we wake up we are free. The analysis of dreams is the counterproof of liberty. In wakefulness, then, we possess time, and being free depends upon being able to dispose of time. Liberty and thought, which are movements, not simple traces of events, depend on the possession of time.

This point provides the basis for an investigation of the intrusion of

dreams into waking and of actions which are automatically amoral: crime, madness, absence of will, of liberty, and of time.

The only action possible in a dream is waking up. But this can occur only if something happens; that is, if there is an interruption which creates emptiness through a discontinuity. "If only something would happen," is what one longs and hopes for when in a state of desperation. Let something happen, even if it is only a mosquito flying by. What is important is the empty space, the rupture which begins the discontinuity which we need in order to be free.

The passage, then, from dreaming to waking occurs in that moment of emptiness in which time begins to flow. Waking is a flowing. Dreaming is something compact and closed, in which takes place something which was conceived of beforehand, whose intention and whose originator are unknown. ("We are shadows of dreams," says Pindar.)

Dreaming, then, is the manifestation of the psyche in its ambiguous character of being both real and unreal. The ambiguity is due to the absence of time. It is the appearance in undifferentiated unity of what will be dissociated later, when consciousness has intervened, into good and evil, positive and negative, beautiful and ugly—opposites which appear together in a certain kind of horror, and the attractive and the repellent which occur together in representations of an erotic, not yet amorous, nature. It is a kind of rotation of that which contains everything, a unity not differentiated because of the absence of time.

Thought destroys the ambiguity, or begins to do so, because it creates the past. The past is past because thought casts it behind; thought casts behind the present or the past which is there, the past which has not departed (as in periods of obsession, which are dreams in wakefulness); thought makes it past. Thinking creates the past as past.

THE TIME OF CONSCIOUSNESS, THE ENVIRONMENT OF THE PERSON

A human being makes use of the time which consciousness makes available to him, consecutive time, a co-ordinate to which any event may be referred. But this does not mean that during wakefulness we are constantly concerned with that time. We may leave it to fall into the atemporality of dreaming. Astonishment and surprise, for example, create a sort of casting-loose from that consecutive kind of time; they constitute a closed interlude, and a moment later the subject has installed himself in the appropriate moment of time—he seizes time on the march, so to speak; and this means that he uses time as an instrument.

Dreams and Time

A human being makes use of time because he is able to stop it; he may ignore what is happening and withdraw from it. "Self-absorption" is a withdrawal from time to the time of dreaming—atemporality—or to a slower rhythm. It is the withdrawal during which thought is born; this is also a closed interlude, blank time, in which thought is born.

The human being is made in time. He fulfils himself in time. Temporality is not decay but a means of fulfilment. At the intersection of what is immobile in the person, with time, is human life. There are two kinds of immobility: the act, actual being—the person as a principle—and the inertia of the eager and immobile psyche, incapable of moving by itself, capable only of passive desire.

The psyche is the material of human life; time is the environment. Adaptation to the environment is, for man, adaptation to his environment. All animals have an environment to which they must adapt themselves. Man does not, says Max Scheler. But man has time, his multiple times.

CONCLUSIONS

The investigation of time in dreams is directed toward the investigation of the multiplicity of times in which man, at least contemporary man, lives:

1. Atemporality of the initial psyche which appears in dreams. Absence of time which may be used to stop, to be astonished, to ask questions of self, to think, of time for thought and liberty.
2. Time established by consciousness: present, past, future. Measurable time.
3. States of lucidity: appearance of a unity of meaning in which time, without having disappeared, has been transcended by this unity where the beginning is already informed by the end.

This last time, insofar as it is creation and thought, is not transferable, just as with dreams. But shared dreams exist, at certain periods of collective, historical life. Certain moments in history are lived as if outside time and history; they are, nevertheless, decisive moments, historical moments.

This investigation tends ultimately toward the establishment of the process of integration of the personality which leads to liberty, to progressive knowledge of self, and to the possession of inner space.

There is a need for a special investigation of dreams of reality in which the situation of the person is shown as well as for an investigation into states such as madness and crime, viewed as extended dreams of the first sort, that is to say, which are characterized by absence of time. The solu-

tion would be to "make something happen," as language has always put it. It is the point of departure for an investigation into action and knowledge, into time and thinking.

It is also the point of departure for an examination which will show ethics arising from the integrating development of the human personality. Not an ethics conferred from without but one required by the very process of human development: ethics and training in liberty. An ethics of making use of time, of entering into and possessing time down to the last instant: morality as taking possession of time.

The basic thesis is that of the multiplicity of vital times; these may be the three planes which have already been indicated: that of the psyche, that of consciousness, and that of the person. To these correspond three kinds of movement: that of the psyche is the ambiguity which is a sign of the absence of time, the need for temporal unfolding, tension without movement; that of the consciousness is movement which grasps and which dissociates, which surrounds and which rejects, which opens and closes: purposeful movement; that of the person is circular and integrating.

"Life is a dream," then, can be explained in this way:

We are originally plunged into the absence of time and of liberty. When time is restored to us, when we recover time, we are free—we enter into freedom. Liberty is a question of time, which is to say that human life is taking over and making use of the reality which is within the dream: taking over the truth-liberty which is inside the dream.

ON THE NATURE OF ECONOMIC GROWTH

Economists today are increasingly concerned with the problem of economic growth. They are inquiring whether it is possible for our economic system to continue the seemingly miraculous business of putting more people to work, making more goods, and adding to the national income. Back in the 1930's their major concern, however, was with depression and instability. The economy then was heading downward in what seemed to be a never ending plunge. The rate of population growth had dropped rapidly, and nineteenth-century chatter about race suicide revived. The limits of our territorial frontiers had long been reached. National output moved sluggishly, and the unemployed huddled with puzzled brows around makeshift fires and apple boxes. Then came the war, and there was a burgeoning need for men in jobs. But, despite expanded income and overtime pay, fewer goods were available than might have been expected. This was the anomaly of inflation, and economists had on their hands a new, though not unfamiliar, problem, which stayed with them even after the war.

Then international politics began to intrude into an already complex situation. The economists took a long look at the so-called "underdeveloped" countries and lo! they discovered a fresh center of interest. They

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became aware of "growth"; they learned that the "underdeveloped" nations, once contemptuously dismissed as backward, might be able to make as good use of modern technology as the West. They observed an insistent pressure in these areas for quick economic advancement. This revealed itself with startling force as country after country sought political independence and economic self-sufficiency. But how would such economies grow? How could they accumulate the capital needed to enable them to take a proud place among the family of full-grown political economies? One could no longer tell these nations that they must be resigned forever to supply raw materials for the West, for there was always the example of totalitarian Russia, employing Draconian devices to build its industry. There, material advance had been stressed as a religious imperative; this was a tempting paradigm. Western economists had to search for ways in which growth might be instituted without the horrible nightmare of the Soviet crash program. Despite this new interest, the theory of economic growth remained on the periphery of the main body of economic doctrine. True, there was some discussion in Adam Smith and David Ricardo of what might be characterized as growth theory; they talked about the "stationary state" and diminishing returns. And there was Marx's "law of capitalist motion." But there was no unified explanation in the literature to show, for example, why Great Britain beat out everyone else in the industrial race, or why the rate of American growth was more rapid during the nineteenth century than it is now.

I. To the classicists the basic theme in economic growth was an unwavering drive toward the stationary state. That did not signify a stagnant economy but merely one in which population, capital, and technology underwent no change. The classical theory of economic development, compounded of elements of Malthusian population, Ricardian wage and rent doctrine, the law of diminishing returns, value based on cost of production, and saving through abstinence, stated that growth depends primarily on capital accumulation. In order to obtain more capital, however, the economy must be able to provide enough profit to encourage businessmen to assume risks. As capital accumulation goes on, wages (derived from a special wage fund) would tend to rise and, according to Malthusian beliefs, would thereby encourage increased population. The consequences are increasing pressures on less fertile land and the depressing specter of diminishing returns. Productivity falls, and the major part of subsequent price increases is appropriated by the landed aristocracy. If

On the Nature of Economic Growth

wage rates rise in an effort to keep pace with higher prices, profit margins must then decline. One, therefore, is faced with the bleak outcome that capital accumulation induces a falling rate of profit. In time, the inducement to save and invest disappears as the economy grinds down to the repetitive cycle of the stationary state. Population just about maintains itself, natural resources are constant; the various forms of capital do not change; consumers keep buying pretty much the same sort of goods; and saving is merely enough to keep capital equipment from wearing out. Thus, the economic system reproduces itself at a constant, changeless rate, and all untoward events are fully anticipated in errorless fashion. The economic system cannot falter; in the language of Joseph A. Schumpeter, it is "hitchless."

To Marx, however, capitalist stability was a contradiction in terms. Maintaining an even keel was a logical impossibility; fluctuation, he insisted, is a built-in feature of capitalist growth. This, it might be noted, anticipated in a general way many of the ideas of later economists, such as Schumpeter, Roy, Harrod, and Keynes. Capital accumulation, agreed Marx, is the central feature in economic growth. New capital feeds on itself as well as on the increase in productivity. As these tendencies—accumulation and greater productivity—reinforce each other, the relative share of "surplus value" in the totality of exchange value tends to decline. Since surplus value is the source of profits, said Marx, its fall discourages additional investment and thus brings about unstable conditions. Here Marx utilized a factor internal to the system itself—the fall in the rate of profit—as the catalytic agent, whereas the classicists resorted to outside forces, such as population, as the underlying drive in growth.

Marx recognized that there was a perpetual race between declining profit rates and technological improvement. Here was a second growth factor that might be employed to explain much of what had happened since *Das Kapital* was published; in fact, any number of economists will agree that technology and innovation are today perhaps the most potent elements in economic change. The Marxian theory, however, was rooted in the notion of the exploitative relation, which was employed to explain the frequency with which the flow of consumer demand was choked off. This, together with the falling rate of profit, could be made to explain the periodic explosions for which capitalism seemed to show some affinity. The difference between Marx's theory of development and that of his forebears—and they all talked about capital accumulation—lay in the fact that to the classicists the process was an automatic one, while Marx recognized

that the whole business was rooted in the behavior of a social class. In classical economics accumulation leads to a widening of markets, more extensive diversion of labor, and greater productivity. Growth is merely a matter of increasing both the instruments of production and the demand for their output. In this way, the economy simply exfoliates like a growing tree. On the other hand, Marx insisted that it was the capitalist who decided how much "surplus value" should be set aside for further investment; accumulation depended ultimately on human desires to save and consume. There was nothing impersonal or automatic about the process.

There were few further additions to the theory of economic growth until Joseph A. Schumpeter began to publish some of his more striking ideas. He had been trying to work out a general theory of business cycles, but, the more he labored at the problem, the more he found it necessary to come to grips with the question of growth and development. Change was basic to capitalism, he insisted. Starting with a simplified model of the economic order, Schumpeter developed the idea of the "circular flow" in which economic life was pretty much the same year after year.¹ Although this did not seem to differ in the main from the classicists' stationary state, Schumpeter's model was periodically disrupted by the intervention of the "innovator," a bold, path-breaking leader, a maker of the better mousetrap, whose introduction of new goods and new methods and new organization upset irrevocably the delicately balanced equilibrium of the "circular flow." It was this process of "creative destruction," said Schumpeter, that paradoxically stimulated change and growth.

But there is nothing gradual in all this, he warned. Innovation develops in clusters; there is a tendency for new techniques to be introduced all at once so that sudden spurts become characteristic of economic advance. Errors in judgment occur as businessmen rush in to take advantage of the innovators' success, involving turbulence and, quite often, collapse. But these are the elements of growth, for out of the destruction of old values the economy moves phoenix-like to higher levels of performance. This underscores the basic difference between Schumpeter and the classicists; to the latter, accumulation was a cause of growth, while to Schumpeter it was the result. The implications that these views might have for grasping the nature of economic change are highlighted when we look at underdeveloped economies, for there the fundamental problem is how to acquire capital in the first instance. Must economic advance await patiently ac-

1. Cf. *Theory of Economic Development* (Cambridge, Mass.: Harvard University Press, 1934).

On the Nature of Economic Growth

cumulated resources? Or will the business of change itself bring about the necessary wherewithal?

II. While the foregoing theories sought to explain growth by a few selected factors which dominate the economic situation, there have been some writers who felt that the basic complexity of the problem makes it impossible to offer any systematic explanations. The leading proponent of this view is the noted statistician, Simon Kuznets, now at the University of Pennsylvania.² A theory, says Kuznets, will have to account for declines in growth, explain the problems of "backward" nations, show why material advances take place in both Western countries and the Soviet orbit, and outline the effects of such seemingly external factors as wars. The major question, says Kuznets, is whether there is available at present enough scientific data to justify the trouble of concocting theoretical formulations. He does not think so, for we still do not possess the "long time and wide space perspective in the empirical foundations of the theory of economic growth—the body of observations from which it must be derived and by which it too must be tested." The existing body of economic information is as yet too elementary to permit really subtle and broad-gauge theoretical constructions. A theory, says Kuznets, must also have considered predictive value, something that economics cannot yet demonstrate. Present-day theories are really nothing more than dogmatic beliefs in some aspects of human nature or some principle of social organization and, in the last analysis, are mere exercises in the philosophy of history! What, then, can the economist do? All that remains, it seems, is to look for hints in detailed studies of business annals and to work up some statements of interrelationships.

Now, not only is this entirely eclectic but at bottom it represents little more than an appeal to pure empiricism. In a sense, Kuznets dodges the crucial task of the economic theorist, that of establishing modes of research. Fact-gathering without a conceptual framework can be quite a sterile business; the purpose of a theory is precisely to avoid such arid procedures. A theory may be viewed simply as an instrumental conceptual

2. A careful if somewhat ponderous worker, Dr. Kuznets has most recently set forth his ideas in a long essay, "Toward a Theory of Economic Growth," which appeared in the Columbia University Bicentennial Conference publication, *National Policy for Economic Welfare*, ed. Robert Lekachman (New York: Doubleday & Co., 1955). Hints of this attitude appeared in his earlier volume, *Economic Change* (New York: W. W. Norton Co., 1953); there are also similar views in his "International Differences in Capital Formation and Financing," in the National Bureau of Economic Research volume, *Capital Formation and Economic Growth* (Princeton, N.J.: Princeton University Press, 1955).

tool which may be employed as an aid in research, to help describe facts and the relationships between them. As applied to "economic growth" it suggests the development of measurements and criteria, which Kuznets himself has aided.³ Kuznets is quite right, however, when he insists that theoretical developments will have to be rooted in such factors as population growth, accumulation of human knowledge, adaptability to technological potentials, and political and social relations between national states. Not unrelated to the last item are such questions as: Must smaller nations always employ drastic measures of self-help in order to secure the savings necessary for growth? Or will they have to seek the kind of aid that may make them merely victims of large empires? Another critical question: Does the kind of forced economic growth imposed by the Soviets on their own peoples distort the economic structure in a way that inevitably strengthens the totalitarian character of the Soviet system? If so, will the underdeveloped nations want to pursue such a course? It is when we raise questions like these that we must resort to the broad, if somewhat loose, explanations for which the word "theory" is employed.

III. W. A. Lewis, a noted British economist, begins by asking⁴ whether such growth is desirable as a social objective. There are certain costs, he says, that are engendered by the painful process of development, and not everyone may believe that rapid economic change is a satisfactory way of reaching social goals. Some people may prefer the habits of a stable society. Nevertheless, continues Lewis, the range of human choice does increase with the extended control over environment which is implied by growth. Growth banishes famine, lessens infant mortality, and eliminates disease. It creates more goods and services and provides time for the pursuit of mental endeavors, and, where human aspirations exceed available resources, it helps to reduce social tensions.

But the cost of these advances must be recognized, we are told. Acquisitiveness becomes ascendant, and the commercial spirit is given full sway. This generates tension at both social and individual levels; social responsibilities may be sidetracked while individual needs are being met. Things become big for their own sake; corporate monopoly enters into the price paid for growth. To all this must be added the maddening discipline of the clock and the excesses of rapid urbanization. Yet it might be asked whether

3. Cf. Joseph A. Schumpeter, "Theoretical Problems of Economic Growth," *Journal of Economic History Supplement*, 1947.

4. Cf. *The Theory of Economic Growth* (London: Allen & Unwin, 1955).

On the Nature of Economic Growth

these are not the costs of hasty industrialization rather than of growth. If urban life were carefully planned and nurtured, need it exhibit the blight it now manifests? A more optimistic view would suggest that man's aspirations can harness the materialism of economic growth with reasoned and directed effort, admits Lewis.

Growth, he continues, stems from three basic causes. First, there is the effort to economize and create more goods. Second, it is stimulated by the increase of knowledge and its application to material techniques. Third, the increase of capital per head of population is bound to help the economy advance. Yet analysis of these elements will not tell us enough about the way in which an economy grows. How, for example, does a society's system of values effect this process? Does a caste-dominated, religion-centered social order inhibit the accumulation of goods? Does equality as a social value facilitate expansion? Do those habits of thought that facilitate growth have accumulative effects, or do they reach some point at which they begin to fetter development?

Lewis then asks: Just how much does capital contribute to the growth process? Studies by Simon Kuznets and Colin Clark, the noted Australian statistician, show that in the advanced nations a net investment of 10 per cent of annual output yields a 3 per cent increase in income. This far exceeds what the underdeveloped countries are able to accomplish. In the former a higher ratio of capital to income means a greater ability to produce heavy equipment and thereby a greater stream of goods. The root of the difficulty for the underdeveloped areas lies in their lack of skills and knowledge, so that the production of an output similar to that of the more developed nations demands an even greater investment. Thus, if India were to maintain a net investment ratio of a mere 4 or 5 per cent, the gap between it and the United States would continue to widen.

This raises a crucial question for the analysis of growth: How fast can capital be accumulated without undue strain on the populace? To judge by the experience of prewar Japan and Germany, it can be accumulated quite rapidly, yet there are limits, for buildings cannot be put up unless there is the requisite complement of bricklayers, carpenters, and masons. Moreover, expansion at a steady rate can proceed only if certain "social overhead" items are provided, such as utilities, docks, water supply, and means of communication. While these do not immediately produce goods, they are, nevertheless, essential to high production. Even in countries where only a modest endowment of natural resources exists, such as Denmark or Switzerland, the existing social overhead provides a basis for a

relatively high level of production. In fact, some nations with a rich supply of resources, lacking such social overhead, cannot match these nations in productivity. Brazil is a case in point.

Examining the components of capital, Lewis finds that in advanced nations housing absorbs 25 per cent, public works 35 per cent, manufacturing and agriculture 30 per cent, and other items 10 per cent. On this basis, Kuznets' analysis (in the National Bureau of Economic Research article cited in n. 2 above) suggests a net investment of from 5 to 15 per cent in Western nations; thus, consumption absorbs even with us the largest part of output. It is interesting to note that Kuznets' data indicate that, even in the initial stages of industrialization, capital formation occurred in spirals. This now seems to have spent itself, so that the share of national income now going into the formation of capital has remained fairly stable.⁵

The problem of increasing real income has been the concern of several other scholars whose major focus has been the "underdeveloped" regions. Norman S. Buchanan and Howard S. Ellis offer a trenchant discussion of the matter in their *Approaches to Economic Development*,⁶ one of the few really comprehensive studies of economic growth currently available. They would agree with Lewis and other observers that the manner and the timing of capital formation are significant problems in the advanced nations. But in the underdeveloped countries, they argue, there is no question of full employment or uneven rates of growth; the only reality that people face there is perpetual poverty. This underscores the simple fact that the process of capital formation must somehow be initiated. While there always was some accumulation in the underdeveloped nations, virtually all of it went to satisfy religious and ceremonial needs. Yet, if the surplus populations⁷ are to be put to work, they must have equipment and tools, for the use of additional labor without an increase in capital would most likely result in inflation. Capital accumulation in Asia and Africa, we are told, means belt-tightening and shunting production from consumer goods to producer goods.

The big question is whether the populace would easily take to a regimen

5. Moses Abramovitz, another NBER economist, argues in a recent paper, *Proceedings of the American Economic Association*, May, 1956, that not only was the rate of growth slowed down in recent history but that its progress has not been a smooth one.

6. New York: Twentieth Century Fund, 1955.

7. The existence of which is almost universal, according to Ragnar Nurske's *Problems of Capital Formation in Underdeveloped Countries* (London: Blackwell, 1953).

On the Nature of Economic Growth

of this kind. While growth would be quickly visible if investment went into drainage and irrigation, thus increasing agricultural output, there would be less to show in the early years should investment go into schools and "social overhead." Unless there were a dictatorial political regime to impose forcibly such policies, resistance might easily arise. Yet there are some writers who argue that rapid development would shock the underdeveloped countries into a sustained rate of growth. These nations would overleap the boundaries of tradition and thus uproot their static habits. Disease, poor diet, lack of sanitation, and inadequate housing all require large capital outlays as remedy—so large, in fact, that they frequently demand state intervention. Proponents of this view, who find voice mainly in United Nations publications, distrust such notions as consumer sovereignty and have no faith in the viability of the free price system. While they would abjure the ruthlessness of Soviet techniques, they nevertheless feel that the "big jump" into modern industrialism can be made, provided the richer nations will help out, thus avoiding the totalitarian approach. And, as Gunnar Myrdal points out,⁸ there is a strong emotional drive in the underdeveloped nations which reinforces this urge for rapid economic growth.

The alternative is for a more gradual approach, one that would allow new ways to be absorbed into society without tumult and upset. It is argued that stagnation would be apt to set in again as soon as foreign aid ceased, unless there is a strong domestic base. The fundamental nature of a society cannot be altered from without, say the gradualists, but must itself respond to internal needs. It does little good, for example, to institute improved health measures without providing also the kind of economy that can sustain the inevitable increase in population. What has happened in Egypt in recent decades illustrates the problem. There, a sharply declining death rate merely increased the pressure on arable land already limited and exacerbated poverty-stricken conditions. A more lasting solution therefore, say the advocates of gradualism, is the slow but persistent accumulation of capital which will move the underdeveloped societies in the direction of permanent change. Professor Ragnar Nurske, for example, stresses the view that growth must in the last analysis stem from domestic savings. While foreign investment, he says, may be helpful, the basic source has got to be the sweat and effort of the people themselves.

In modern societies a major cause of growth is technological change.

8. Cf. *An International Economy* (New York: Harper & Bros., 1956).

But, as Schumpeter has pointed out, a distinction must be made between invention and innovation. While the former, he said, is a technical and scientific accomplishment, the latter is an economic and sociological event. An invention does not become an innovation until it is absorbed into the main stream of industrial life. And, in order to achieve this, the businessman must be able to visualize a flow of profits streaming from the act of innovation. In a quite significant sense, therefore, the businessman's expectations condition the process of innovation and growth.

An innovation must be either cost-reducing or quality-improving if it is to be profitable, and, since it frequently results in a substitution of new goods for old, it can have a far-reaching effect on the rate of capital formation. When innovations are linked—that is, when they lead to other innovations, as in the automobile industry—the impact on society is indeed profound. It is this process of linkage, together with the tendency for innovations to “bunch up,” that becomes a prime mover in economic growth. Some of the effects that ensue are short run in character, but others may create a permanent wrenching of the economic structure. The impact on investment is quite direct; some firms find that their individual growth may have been retarded as a result of an innovation and may consequently employ their now redundant capital to liquidate debt or pay out dividends. However, new and growing firms will increase investment and use relatively more capital, thus tending to make the economy more viable. But, as these slow down, the thorny problem of stagnation may once again raise its head.

Now, someone has to carry through an innovation, and in this sense we are interested in those who become the personal vehicles of growth. Ever since Adam Smith, such people have been designated as entrepreneurs or, literally, “undertakers.” Professor Thomas C. Cochran, of the University of Pennsylvania, says⁹ that the businessman plays his role in accumulating capital and effecting innovation through a complex of factors comprising personality conflicts, cultural attitudes, technological possibilities, and the use of available resources. To Cochran, the entrepreneur's major service is to mobilize savings and apply the resulting financial capital to the problem of increasing productivity. At this point, Cochran tests his hypothesis by reviewing the job of the entrepreneur in American history. The evidence, he says, suggests the following generalization: Early American communities discovered in America an extraordinary low man-land ratio and

9. Cf. his article, “The Entrepreneur in American Capital Formation,” in the NBER volume.

On the Nature of Economic Growth

an unbelievable opportunity for increasing returns on their investment. As a result, a premium was placed on devices that would save man-hours. In addition, the relative absence of Old World rigidities favored entrepreneurial activity, and in time the adventurous businessman was no longer viewed as quite the social deviant that aristocratic values made him out to be. The entrepreneur became a common phenomenon and lent leadership to the new communities on this side of the ocean. In many small towns in the eighteenth and early nineteenth centuries, Cochran says, the general store became the focus of business and social life and the owner a figure of community power. Capital accumulation kept pace with business expansion; banks became permanent parts of the economic landscape; government helped out with patent laws, rights of way, and land grants; and American culture became an entrepreneurial culture. Of course, there were many miscalculations and failures, many entries and exits; managerial skill "was learned at the expense of empty-handed creditors."

But in the twentieth century, the functions of the entrepreneur have been bureaucratized. The entrepreneur has been made obsolescent through the rise of the professional executive, the growing importance of the financier, and the clamping-down of government regulation. Even his area of operation has been restricted: highways, bridges, and power facilities are now the special province of government investment, and, with the coming of the garrison economy, the private entrepreneur's scope is even more limited. It is Cochran's belief that the entrepreneur has successfully worked himself out of a job; his role in capital formation and economic growth is now a dubious one. There are serious implications in this approach, for it leads to the startling thought that even "growth" itself has become bureaucratized. And, in fact, those who point to the fantastic abilities of modern corporations to finance investment out of their own resources would doubtless lend support to the Cochran view. Progress is no longer an adventure but a calculated, carefully weighed proposition packaged in the corporate conference room.

IV. Most economic theorists, however, express doubt that growth can continue indefinitely. Paul T. Homan, a noted elder statesman among economists, once remarked that, if present figures were projected into the future, the national output would have to be stated in multiple trillions and that average family incomes would be at least ten times greater than they are now. The fact is that growth is always beset by disturbances of

various kinds, stemming from unsuccessful risks and innovative failures.

It is this ever present prospect of a downturn that impelled many economists to look for the key to growth in certain internal relationships, such as investment to income. While they observed that lags in income could be corrected by increased investment, they frequently overlooked the fact that such investment invariably increased total productive capacity even more than was the case previously. Some writers felt that, since this was a problem for "long-run analysis," it could be safely ignored in short-term predictions. It was Roy F. Harrod, the biographer of Keynes, and a leading British theorist in his own right, who first called attention, in 1939, to this problem of augmented industrial capacity.¹⁰ The basic question, said Harrod, is: What is the rate of growth in income which is required to insure the full use of an ever *increasing* quantity of capital? Furthermore, can such a rate of growth sustain itself, or must it sooner or later break down? Would deviations from the required rate of growth stimulate any corrective forces? How is this rate related to the needs of full employment? Suppose actual growth falls short of full employment? What steps are necessary to bring growth up to full-employment levels, or must the economy first fall on its face? Would explosive inflationary conditions set in should the actual growth rate exceed what is required for full employment? None of these questions is really easy to answer, and much technical ingenuity has been expended in constructing elegantly erudite solutions. But, as Daniel Hamburg, of the University of Maryland, remarks in his excellent study of the problem,¹¹ the purpose has been "to perceive in precise terms the relations between the long-run forces of economic growth and the forces inducing instability in the growth of income such as has characterized the development of capitalism."

One of the more lucid presentations of the problem was that made by Evsey Domar in 1947.¹² Addressing himself to the problem of determining what rate of growth in national income would maintain full employment, Domar observed that investment exhibits a *dual* character in that it not

10. Cf. "An Essay in Dynamic Theory" and "Supplement on Dynamic Theory" in *Economic Essays* (New York: Harcourt, Brace & Co., 1952). The first of these was originally published in 1939. Others who have written on this problem are Evsey Domar, "Expansion and Employment," *American Economic Review*, March, 1947, and "Problem of Capital Accumulation," *American Economic Review*, December, 1948, and M. Kalecki, *Theory of Economic Dynamics* (London: Allen & Unwin, 1954).

11. *Economic Growth and Instability* (New York: W. W. Norton Co., 1956).

12. See Domar's article, "Expansion and Employment" in *American Economic Review*, March, 1947.

On the Nature of Economic Growth

only generates income but also increases productive capacity. The Keynesian proposition that savings equals investment and that income paid out must return to the productive process are formulations that merely maintain the status quo. A more realistic conception, said Domar, would make room for added capital formation and the subsequent increase in the ability to produce.

Now, such new capital might be either unused, merely put to one side, or employed at the expense of earlier, older capital, or possibly substituted for labor and other factors. The first instance represents a simple waste of resources, while the others are changes that always take place in a dynamic economy. Yet such problems are seldom, if at all, set forth in standard Keynesian doctrine, argued Domar, in which employment is a relatively uncomplicated function of income. More technically, the problem is to ascertain the magnitude of investment required to make the increase in income equal to the increase in productive capacity. This suggests that employment ought to be visualized as a function of the ratio of income to productive capacity. The difficulty, of course, is the definition of productive capacity, but this may be stated as output at full employment. Thus the problem is reduced by Domar to an equation in which the required ratio of growth is established by setting the rate of increase in productive capacity equal to the rate of increase in income. In analytical terms this means that continuous full employment can be attained only if investment and income grow at constant annual percentage rates which are equal to the product of marginal propensity to save and the average propensity of investment. This is a terribly technical way of saying that simple offsets to saving are insufficient to maintain full employment—that, in fact, investment must always exceed saving. The economy must be somewhat like the Einsteinian universe, always expanding at an accelerated rate.

The likelihood of investment increasing *all* the time is at best moot. Yet, if investment does not satisfy the conditions of required growth set forth by these relationships, excess capacity would set in and inhibit further investment. In situations engendered by a monopolistic economy, such excess capacity is clearly a threat to continued growth and expansion.

Harrod, on the other hand, argued¹³ that the economy can develop a rate of growth that would be consonant with full capacity operation. While Harrod employs a rather high degree of abstraction, his model is a dynamic one in that he assumes productive technique to be improving. Now, the "warranted" rate is that which insures a continuation of invest-

13. Cf. *Towards a Dynamic Economics* (New York: Macmillan Co., 1948).

ment at levels that meet the profit expectations of the businessman. Unexpected, unanticipated results in output are due entirely to changes in investment plans. However, limitations on "warranted" growth are set by the size of the labor force and the current state of technology. "Warranted" growth is, therefore, a ceiling rate set by existing economic conditions. In one important sense this notion is really nothing more than "potential" growth, and, if this exceeds *actual* growth, then stagnation will be the outcome. That is to say, the economic system has failed to meet its promise. In the reverse condition, one in which actual growth is greater than what appears to be inherent in the current economic situation, a state of perpetual exhilaration is created in which facilities are expanded and inflationary pressures accumulate.

Another cornerstone of Harrod's model is the "acceleration" factor, which says that there is a fixed relationship between the quantity of a flow and the size of the stock from which it comes. To illustrate, there is a definite relation among purchases, inventories, and sales. Shifts in the rate of sales may lead to more than a proportionate change in the rate of purchases, so that the final effect is magnified. Now, when sales decline, there is a tendency to cut back on investment. Should this react particularly on consumer-goods industries, net investment may very well become a negative quantity, and the nightmare of excess capacity might arise. Similarly, an increase in sales may be a harbinger of economic exhilaration. Now, while "acceleration" may have little influence in the early stages of cyclical upswing because of existing excess capacities, it can have a choking effect as the upper limits of the cycle are attained. Then the usual bottlenecks and shortages begin to plague the economy. The businessman, however, is generally satisfied if income is increasing fast enough to justify the outlay on new capital. Thus, the higher the income, the higher the investment, and, again, the higher the income, on and on in continuing leapfrog fashion, with the economy running ever faster as though on a giant treadmill.

Further analysis of growth requires that a distinction be made among different kinds of investment. Harrod separates "autonomous" from "induced" investment. The former, which results from innovation and is therefore independent of sales and current output, does not need the stimulus of income expansion to get going; only an adventurous spirit and the unremitting search for profit is required. The latter kind of investment, however, is directly connected with output and, consequently, depends on "acceleration." If sales in the immediate past have been brisk and

On the Nature of Economic Growth

future prospects are good enough to create a real sense of certainty, then induced investment will be given a considerable fillip. Should prosperity be extended, profits may very well become extraordinary. In fact, conditions may be so good that it may become difficult to distinguish between autonomous and induced investment. However, in such a situation the growth of income must be more rapid than ever, for there must be enough created to absorb the savings generated by both types. What may very well come about, as Hamburg says, is a condition of sustained periods of economic exhilaration alternating with long periods of stagnation.

It is most unlikely, says Hamburg, that growth would be continuous. Some firms expand while others go out of existence. A smooth growth configuration cannot be derived from innovation, for this comes in spurts and clusters, creating all sorts of turbulences. Furthermore, existing firms are hardly the ones that introduce innovation. They usually stand pat, so that new ways of doing business or new ways of making things require an "adventurous" concern. Monopoly, cartels, a fear of excess capacity, the rise of the professional manager—all may exert dampening effects on any tendency for unceasing expansion.

The present situation, especially in world population trends, underscores the urgency of continuing economic development. With an increase each year in the labor force, there is a need for a growth pattern that would absorb new members. In the absence of such absorptive capacity, the increased supply of man-hours coupled with increased labor productivity would only lead to a "labor reserve," a condition, it will be recalled, predicted by Marx. To overcome this, it would be necessary for income to rise directly with labor supply and productivity. Hamburg quite rightly stresses the importance of this concept, for all too often growth has been discussed solely in terms of the increase in capital. It is quite possible that the full use of capital equipment would not lead to full employment of labor, particularly in an economy where the use of capital is directed toward labor-saving devices as with automation. Further, it is conceivable that the growth rate of capital might exceed "full-employment" growth, so that the tendency toward excessive capital accumulation would be reinforced, eventually leading to a depressing effect. On the other hand, in underdeveloped countries, a tendency for "full-employment" growth to exceed capital growth results in what economists call "involuntary employment." Such a condition, says Hamburg, can be overcome by resorting to the kind of investment that stems from innovations rather than from sources internal to the economy itself. But innovation does not have

a strong effect where there is a considerable backlog of idle capacity. Consequently, it is the interplay of factors such as these that makes for secular stagnation, and it apparently takes the strength of a garrison economy's innovative impact to dispel the drag of idle capacity.

Yet the situation today is hardly like this at all. We are in a condition of secular exhilaration, one probably due to an overabundance of the innovative, autonomous kind of investment. In the present milieu, such investments exhibit a self-generating character, since extremely favorable profit margins encourage the introduction of new devices and gadgets while at the same time relatively high income levels create an atmosphere of receptivity to change. Further, at levels of high economic activity, people may be placing more stress on consumption than on saving. This may weaken the role of the induced type of investment, from which is derived the purely internal growth drives. As a result, autonomous investment may displace induced investment during prosperous times. Suppose now that the profitability of autonomous investment begins to wear out; it is evident that in such circumstances the sense of exhilaration may quickly evaporate as economic growth grinds to a painful halt.

An upward movement in perpetuity, according to this theory, is a debatable question. Distortions in the physical structure of production may ensue which in turn could markedly affect the growth line. Differences in rates of growth in various parts of the economy may require a redirection of output, perhaps from capital-goods industries to consumer goods. Such a contingency could cause idle capacity to appear in some sectors and so break the circular flow of income. In fact, a problem of this sort may very well be at the root of the difficulties faced by the Soviet economy, for it is conceivable that an absolute imperative toward capital-goods production has been built into Russian industry, thus making it by now a superhuman task to supply an adequate flow of consumer goods. As Adolph Lowe says,¹⁴ the way in which the different sectors of the economy are structured can have a significant impact on growth. In most instances the process of growing is carried on by only a few major sectors of the economy. These may be based on new technology, as in British textiles in the eighteenth century or American transportation in the nineteenth, or on political motivations. Such changes may set in motion a host of corollary lines as with the automobile industry, but the historical evidence suggests that major growth patterns do not involve the entire economic system. As a result, it is entirely possible to draw fairly pessimistic infer-

14. Cf. his paper, "Structural Analysis of Real Capital Formation," in the NBER volume.

On the Nature of Economic Growth

ences should the impetus toward expansion give out in the major sectors.

William Fellner, a Yale University economist and successor to the late Irving Fisher, rejects such a gloomy outlook.¹⁵ Fellner employs, in the main, the same general techniques as Harrod and Hamburg but arrives at quite different conclusions. He acknowledges that in a growing economy investment must keep pace with total savings, but, says he, if the economy is enjoying a condition of exhilaration, there will be inevitably an adequate supply of savings to match investment. But, while this "matching" problem may be basic, it cannot become a really serious matter so long as there are enough technological improvements to provide investment outlets.

An approach such as Fellner's, which places stress on the relationship of technological advances to available resources, is fundamentally an effort to expose the "structural" problem. He contends that the essential requirement is to heighten productivity in order to encourage investment. By doing so, the economy would be able to overcome the insufficiency of "planned investment," a condition that has in the past led to a slowing-down of growth. This leads Fellner into some rather odd pathways: growth becomes a purely "psychic" phenomena, and idle capacity is of no great importance so long as entrepreneurs do not consider the total stock of capital as excessive. This suggests, too, that unemployment and growth are not really incompatible. However, it is not made clear whether businessmen's plans for expansion could be long sustained in the face of declining purchasing power.

Fellner makes much of the problem of matching saving and investment and securing what he considers a correct time sequence. He fears that too much variation from a smooth growth path would upset the entire apple cart and cause either uncontrolled inflation or stagnation. The limits of tolerance, he says, are quite small; in the final analysis, steady growth demands that net capital formation (that is, investment) always equals net savings at a stable general price level. This is indeed a tall order, and it is precisely the difficulty of achieving such stability that is underscored by Harrod and Hamburg. But Fellner is undismayed, for, says he, a smooth pattern can be worked out through the effective control of money; in addition, capital must always be more abundant than labor (so that the old devil of diminishing returns may be exorcised), and structural shifts must be gradual so that bottlenecks and distortions arising from the improper application of resources may be avoided.

But Fellner's views are not entirely clear; while sometimes perturbed by

15. Cf. *Trends and Cycles in Economic Activity* (New York: Henry Holt & Co., 1956).

divergences from smooth growth rates, at other times he insists that the possibility of instability has been exaggerated. This is so, he says, because planned investment is set in a *range* of magnitudes, and, so long as what is actually attained falls within the anticipated limits, no great harm will have been done by straying slightly from the mark. A divergence from what is necessary for upward growth has generally been temporary anyway, and, should economic conditions worsen, a point would eventually be reached where the need for some goods and some investment would set things going again. But this was precisely the sort of analysis of economic change that was offered twenty-five years ago, and it seems just about as helpful now as it was then. What Fellner suggests basically is that growth depends on the compatibility of expectations and the plans stemming from them. Since we know that expectations and results will not always jibe, says he, continuous little adjustments must be made to avoid malinvestment, and the best place to effect such numerous adjustments is, of course, the free market!

The fact is that the elimination of structural disproportions in the economy would not necessarily give an easy solution to violent and sharp changes. Such adjustments would never be quick enough to overcome the strains of growth; raw materials and labor cannot be moved about like chess pieces on a board, nor is it possible to convert factories quickly to alternative uses. Nor can fluctuations be dampened or eliminated by the correction of structural disproportions, for the fundamental relationships among savings, investment, and income would continue to operate even if all segments of the economy were affected the same way.

V. Thus, the problem of growth is complicated by the fact that investment and consumption are always going on at different rates of speed in different parts of the economy. While this is happening, the nature of the commodity basket itself is undergoing change, so that different recipes for mixing economic ingredients—capital and labor—are required. This sets limits to both the rate and the extent of growth. There also are other limits: availability of finance, existing industrial capacity, and, for countries with a high foreign-trade component, the balance of payments itself. Joan Robinson has argued¹⁶ that growth can take place only if there is “a technical surplus available above subsistence,” and within that limit if there is a “surplus above the level of real wages that the workers are willing to accept,” and within that limit if the entrepreneurs energetically carry out

16. Cf. *The Accumulation of Capital* (New York: Macmillan Co., 1956).

On the Nature of Economic Growth

the business of accumulation. That is to say, growth ultimately depends on the totality of savings that an economy can set aside.

But economic growth under these conditions is a precarious affair. The savings and investment process may break down for any number of reasons, among which are a shift in the technological substructure of industry, an increase in the number of monopolistic situations, or a rise in productivity without any commensurate change in investment. The problem may be intensified when there is a lack of sufficient capital, as is illustrated by the comparison of the growth experience of the United States and other nations. Among the latter, low income and low productivity stem from an inadequacy in both the amount and the utilization of capital. The suggestion that they should acquire more equipment merely underscores the dilemma in which they find themselves, for the accumulation of capital presumes a sufficiency of income and a high-enough level of productivity to provide the wherewithal.

In the meantime the advanced nations, which form a small part of the world's peoples, not only keep getting richer but have a common expectation that in the future they will be able to provide more economic opportunity for their citizens and even higher consumption standards. They anticipate all this despite the fact that international relations were beset in the last forty years by numerous calamities which should have impeded the course of economic growth. But these frequent crises and wars merely intensified the concern with the state of *national* economics, while at the same time international economic relations, so essential to the well-being of the less fortunate nations, have continued to deteriorate. As Gunnar Myrdal argues,¹⁷ growth is a matter of concern for all nations, not only the West. Unfortunately, the retreat to economic nationalism and the ensuing damage to international growth continue unabated. Myrdal sees evidence of this in the drastic decline in the movements of capital and labor; virtually all nations now seal their borders against intruders from other labor markets, while the flow of international capital, which could help stimulate growth in Latin America or southern Asia, has virtually ceased except for the reinvestment of profits or some new investment in colonial areas whose economy can be controlled from metropolitan centers. With attention focused only on internal economies, import barriers in most countries have risen. Together with currency and payment restrictions, these practices have progressed from being mere symptoms of economic dislocation to becoming root causes.

The problem of economic growth is sharpened when the disparities in

17. *Op. cit.*

capital resources, labor productivity, and skills, and consequently in living standards, between the advanced and underdeveloped nations is exhibited to full view. The latter are seemingly determined to do away with their "have-not" status; they are breaking away from old traditions. That this sometimes assumes the form of violent nationalism or a flirtation with communism is not unexpected. Drives for economic growth are often converted into ambitious political programs for the adoption of modern industrial techniques. But, while the underdeveloped nations want to skip the stage of capital accumulation, they at the same time lack the international capital market which eased the rigors of growth of the West. The idea of economic growth and the high standard of living it brings in its wake—based on decades of capital accumulation—have gone forth from the Western countries to the underdeveloped nations which now have the advice but not the capital.

Myrdal says that the underdeveloped areas need a deliberate population policy which will help reduce pressure on resources. He insists that governments will have to play a more significant role than they did when the Western economies were in their growing stages. Certain reforms will have to be instituted. But the basic approach is a program of self-help intended to stimulate savings at the high levels and to do all this when consumption levels are low, with little or no capital imports and widely fluctuating prices for export commodities. The underdeveloped nations will have to search for a greater diversity of products in their output, while all available foreign exchange is used to acquire producers goods. But Myrdal is not sanguine about prospects. "Short of a number of near miracles," says he, "few underdeveloped countries will succeed in attaining their essential goals." Yet only when these underprivileged nations, with their vast numbers of humans of different colors, religions, and cultures, have attained equality of opportunity will the full potentials of economic growth be reached. This is Myrdal's basic concept, and it is one we can ill afford to shunt aside. The problem is not merely an economic or political one; it is essentially a moral question, for, asks Myrdal, can the Western nations, whose prospect for continued growth remains undiminished, continue to look inwardly and build only a nationalistic parochial paradise, while multitudes in Asia, Africa, and Latin America strive for just a little more sustenance? Moreover, can we afford to let these peoples follow willy-nilly the totalitarian way to industrialization? Yet, while the urgency of these questions seems incontestable, one wonders whether the quality of modern high politics will permit more than a cavalier approach to their ultimate answer.

PRIMITIVE MESSIANISM AND AN ETHNOLOGICAL PROBLEM

One of the perennial problems of theoretical ethnology has been the interpretation of cultural similarities between remote peoples. In fact, the question troubled observers long before the rise of anthropology as a distinct branch of learning. When the painter George Catlin saw Mandan Indians crossing the Missouri in hide-covered craft resembling an inverted open umbrella, he recalled the Welsh coracle and concocted the amazing theory that the Mandan were the descendants of Welsh immigrants to America. Equally flimsy was the view that the natives of America represented the Ten Lost Tribes of Israel because redskin and Jew shared such observances as menstrual taboos—customs by no means peculiar to them.

How significant the relevant problem appeared to a strictly scientific founder of modern anthropology is clear from Edward B. Tylor's *Researches into the Early History of Mankind* (New York: Holt, 1865), for virtually the whole book revolves about this theme. It has continued to intrigue later scholars, who were grouped into two opposing camps. Some, following Adolf Bastian, inclined to explain resemblances as due to the psychic unity of mankind, which would everywhere produce

similar responses unless the geographical setting was inhibitory. An extreme upholder of this doctrine was the American Daniel G. Brinton, who maintained that even neighboring peoples did not borrow each other's myths but evolved them in complete mutual independence. This particular application of the general principle was convincingly refuted by Franz Boas's investigations of Northwest American mythology (1895). He was able to prove that, broadly speaking, the similarity between the total stock of mythological tales known to two tribes on the coast of British Columbia varied with the distance between the populations in question. To phrase the conclusion differently, without challenging the possibility of independent developments as a consequence of a like mentality dealing with like conditions, Boas demonstrated the need for a historical outlook: the origin of tales could not be profitably discussed unless attention were paid to the historical relations of the tribes which narrated the stories compared.

Whereas Boas adhered to an intermediate position, which involved settling every individual case on its merits, other scholars assumed an intransigent attitude. For example, Friedrich Ratzel in his *Völkerkunde* (Leipzig, 1885-88) insisted on the uninventiveness of mankind and on the constant migrations of early peoples. Thus, whatever ideas had been developed here and there were sure to be picked up by the ever wandering hordes of savages and would be carried to the four corners of the globe. In the early part of the twentieth century Friedrich Graebner, elaborating this general position, published his *Methode der Ethnologie* (Heidelberg: Winter, 1911), which codified the principles to be followed in reconstructing the history of cultural achievements. He soon gained a powerful coadjutor in Father Wilhelm Schmidt, whose influence then eclipsed that of his predecessor. In England, G. Elliot Smith, supported by W. J. Perry (*The Children of the Sun* [London: Methuen, 1923]) and in some measure by W. H. R. Rivers, derived practically all cultural developments from ancient Egypt, where alone, as he contended, there existed the physical conditions that would favor cultural advancement. For present purposes it is not necessary to enter into the specific features of these several schools but only into what is common to all of them. This is the deep-rooted conviction that humanity suffers from a great poverty of creative ideas; that, accordingly, it is extremely unlikely that any invention would have arisen twice, let alone an indefinite number of times; that as a corollary the parallels noted in custom, crafts, beliefs, and social structure must be due to dissemination from a single center.

Primitive Messianism and an Ethnological Problem

Champions of this position lay claim to a logical superiority over their adversaries; they argue that, whereas *they* have criteria for determining the occurrence of diffusion, their opponents have none for ascertaining independent development. Without entering this particular argument, which is bound to remain on an abstract level, we may ask a question that admits of an empirical decision: Are there any indubitable instances of the independent duplication of cultural phenomena? In my opinion, the messianic cults of primitive peoples not only are of great intrinsic interest but also provide inexpugnable proof that cultural traits *may* originate independently in distinct major areas. This thesis naturally does not contravene the fact that within these territories there is an indefinite amount of provable transmission of ideas from tribe to tribe. The areas I shall mainly touch upon from this point of view are America, Africa, and Oceania, because the sources for these regions are especially abundant.¹

First of all, we must define a number of related and easily confused concepts. A messiah is necessarily a deliverer from present tribulations or impending calamities; the prescriptions and prohibitions which he promulgates in order to compass his ends constitute the savior's cult. But he need not be a revivalist; in fact, he may appear as an iconoclastic innovator. It is true that in many situations the messiah inveighs against apostates from ancient usage, which he tries to restore; but contrary instances, if perhaps on the whole less numerous, are certainly not less striking. Finally, we must beware of the frequently used term "nativism." It is only when a movement deliberately aims at the neutralization, expulsion, or annihilation of outsiders that we can properly call it "nativistic." By no means have all messiahs exhibited such xenophobia; Wovoka, the fountainhead of the greatest emotional upheaval known from among the Plains Indians, will be dealt with presently; for the moment suffice it to say that his original gospel was all in favor of the universal brotherhood of mankind. Furthermore, "nativism" need not be exclusive of foreign *culture*, as will become apparent from Oceanian phenomena of the postwar period. For that reason we cannot quite accept the definition proposed by the late Professor Linton,² which puts all the emphasis on a conscious organized attempt to revive or perpetuate the traditional way of life in some of its aspects. Certainly, such aspirations have often made themselves felt, but, in addition, there is also a type of nativism that enthusiastically embraces

1. For a general summary of relevant data see Wilson D. Wallis, *Messiahs: Their Role in Civilization* (Washington, D.C., American Council on Public Affairs, 1943).

2. Ralph Linton, "Nativist Movements," *American Anthropologist*, XLV (1943), 230-40.

the foreign culture in order to further indigenous interests. Nativism is thus consistent with cultural iconoclasm.

Having defined our concepts, let us turn to the phenomena. By a historical accident our material on messianism is most abundant for movements stimulated by the clash of peoples, one of whom has been in possession of a vastly superior technology. The resulting superiority in weapons has led to domination and colonialism, from which the native messiah promises to relieve his compatriots. Let us recognize that manifestations of this order form merely a special case. Theoretically, quite as significant is messianism that springs from internal causes.

However, we may begin our survey with the more amply described type. A characteristic sequence is: real or imagined wrongs suffered by an aboriginal population; imperfect assimilation of the intruders' religion; a resulting mixture of native and extraneous theological notions; a gospel of deliverance resting on this synthesis. A curious feature of these cults is the propagandist fervor of the votaries, for in many of the societies in question proselytizing is quite antagonistic to the spirit of the native faith.

To start with South American instances, between 1850 and 1900 a fairly steady succession of prophets arose in the Rio Negro country in southwestern Brazil, each representing himself as a second Christ. One of them called himself "the father of missionaries," communed with the spirits of the dead, and made his followers dance around a cross. Another created a great stir as a healer who cured his patients by stroking their bodies and blowing his breath on them. He, too, made his flock dance day and night, to the utter neglect of their plantations, for the messiah could make the crops prosper by simply blessing them. Such lofty disdain for the common-sense operations of economic routine is a constantly recurring motif in aboriginal messianism.

To Dr. A. Métraux we owe the discovery of corresponding data from sections of the continent much farther to the south. As early as 1579, we learn, a Guaraní appearing on the Paraná River, pretended to be the divine son of a virgin. Like the Rio Negro prophets, he prescribed continuous dancing and chanting, with the inevitable concomitant that the farms were abandoned. Two centuries later an itinerant messiah of the Chiriguano tribe (Gran Chaco) claimed the power of destroying towns, producing a shower of fire, and transforming human beings into rocks. On his travels he was accompanied by a woman who was allegedly the Holy Virgin.³

3. A. Métraux, "Les Hommes-dieux chez les chiriguano et dans l'Amerique du Sud," *Revista del Instituto de Etnología de la Universidad Nacional de Tucumán*, II (1931), 66-91.

Primitive Messianism and an Ethnological Problem

Because of the range of its sway and the military uprising in its wake, none of the preaching cults has attracted as much attention as "the Ghost Dance of 1890," which started in Nevada and rapidly swept across the Plains, affecting tribes a thousand miles to the east. It began with the preaching of Wovoka, the Paviotso Indian, briefly mentioned earlier in this essay. Working for and among whites, he had gained some acquaintance with Christian ideas, and, after visions experienced in 1888 or thereabouts, he occasionally professed to be Christ. The world, he taught, was old and required rejuvenation; with that end in view, he had come with a message from God, exhorting the Indians to live in peace with one another and the white people. This part of his doctrines came to be automatically altered by the warlike Dakota, who turned Wovoka's message of universal brotherhood into a politically nativistic cult and rose in armed rebellion against the government of the United States. Wovoka himself was not responsible for this outbreak; apart from his moralistic injunctions, he stressed the possibility of a reunion with one's deceased relatives. With that view in mind the Indians were to dance in the manner revealed to the messiah in his vision. The constantly recurring emphasis on dancing by both North and South American prophets must be connected with a quite general association in aboriginal America of the most sacred ceremonials with songs and dances.

To apply to the phenomena cited the two rival theories of diffusion and independent parallelism, it must first be noted that no scholar denies that a great many of the messianic manifestations are due to transmission from a common center. This is a matter not of speculative interpretation but of authentic record. Scholars have devoted much work precisely to demonstrating step by step how one tribe transmitted its newly acquired creed to another and what metamorphoses accompanied the process. For instance, we definitely know the messengers sent by the Cheyenne and Kiowa to Wovoka as well as the nature of their reports on returning to their tribesmen. Among the striking results of these researches was the discovery that Wovoka was not the creator of the essential doctrines he preached but had had a predecessor, Wodziwob, among his own people as early as 1870. This earlier dispensation had also spread widely, though in the opposite direction, not to the high Plains, but to northern California, where the details of the movement have been painstakingly worked out by Professors A. L. Kroeber, Anna H. Gayton, and Cora DuBois.

But even Wodziwob cannot figure as the initiator of the Ghost Dance. As Professor Leslie Spier has shown, the core of its creed can be traced to

the plateau of Washington and to interior British Columbia. What is more, these northern occurrences are datable considerably earlier than the equivalent phenomenon in Nevada, in part even antedating any Christian influences.⁴

But though diffusion is an unchallengeable fact, as soon as we envisage the totality of pertinent data in the New World, independent parallelism is no less certain. In early post-Columbian times communications within the Western Hemisphere were such as to preclude dissemination of beliefs and rites from, say, the Guarani of 1579 to the Plateau tribes of 1800. The peculiar fusion of autochthonous pagan and imported Christian notions must have been accomplished in mutual independence. How often this happened is an interesting ethnographical question but does not affect our thesis, which is established by a single instance of duplication without historical connection.

However, the argument derives further support from extra-American evidence. In 1818 one Makanna appeared among his South African tribesmen, arrogating to himself the distinction of being Christ's brother. He synthesized this conception with the traditional reliance on ancestral spirits. With their aid he would drive the English into the sea, thus avenging his people's grievances. In an attack on the British forces he reassured his own troops with the promise that the enemy's fire would turn into water. Another Bantu leader, during a later revolt, ordered a wholesale destruction of his followers' grain and livestock; by his wonder-working he would resuscitate the cattle at a fixed date. In 1921 a messiah on the lower Congo continued the gospel of political nativism "in the name of Jesus Christ," predicting the expulsion of the whites by divine agency.⁵

Parallels have been found in various other disconnected areas. On the island of Biak, off the coast of Dutch New Guinea, a missionary noted five cult manifestations during his years of service. One of the leaders, who identified his wife with the Mother of God, declared that he had stood with her before God's throne in heaven. Manna was going to fall from the skies, so that the Papuans could afford to destroy their gardens and to

4. James Mooney, "The Ghost Dance Religion," *Fourteenth Annual Report of the Bureau of American Ethnology*, Part II (Washington, D.C., 1896); A. L. Kroeber, *Handbook of the Indians of California* (Washington, D.C., 1925), pp. 868-73; Cora DuBois, *The 1870 Ghost Dance* ("Anthropological Records," Vol. III, No. 1 [Berkeley, 1939]); Leslie Spier, *The Prophet Dance of the Northwest and Its Derivatives: The Source of the Ghost Dance* ("General Series in Anthropology," No. 1 [Menasha, Wis., 1935]).

5. Joseph Shooter, *The Kafirs of Natal and the Zulu Country* (London, 1857), pp. 195-212. Cf. S. C. Willoughby, *The Soul of the Bantu* (New York, 1928), pp. 123-26.

slaughter their pigs. The several messiahs assumed such titles as "Prince of Peace" or "Lord of Baptism." They presaged the approach of a celestial boat which they identified with Noah's ark.⁶

The amalgamation of biblical with aboriginal notions has thus taken place again and again without transmission from one major area to another. Irrespective of Christian influence and the generic resemblances it precipitates, one cannot help being impressed with certain extremely specific correspondences. As the Bantu messiah of 1818 promised to turn the fire from British guns into water, so in 1912 the leader of the last Chiriguano uprising told his men that the enemy's firearms would spout nothing but water (*allaient cracher de l'eau*), so that it would be easy to overcome them with bows and arrows. Astonishingly frequent is the injunction to neglect normal economic activities on the theory that the messiah or his divine patrons would provide. Very old, because utterly at variance with the social standards of the American and Oceanian tribes in question, is the cropping-up, even though only temporarily, of a stringent asceticism. Men are to abstain from liquor, limit themselves to monogamous unions, and eschew sexual dissipation. This inconoclastic trend will be treated presently with reference to even more astonishing manifestations.

The xenophobia often precipitated by the collision of distinct races has taken two radically contrasting forms. The difference hinges on whether the leaders dictate an uncompromising restoration of the good old ways or an espousal of alien culture for the purpose of hoisting the enemy with his own petard. Linton insisted that nativists only selected particular segments of the traditional culture for revival, but as a universal proposition the statement will not hold. The anonymous Delaware Indian messiah of 1762 expressly urged his fellows to renounce *all* the white man's gifts. God had told him that the Indian needed "neither gun, powder nor any other object" imported by the traders and "to live entirely in the original state that they were in"; even the strike-a-light was banned in favor of the firedrill.⁷ It may be true that alien ideas may sometimes unwittingly have crept into the attempted carrying-out of such injunctions, but the intent was manifestly to establish an ideological *ancien régime*.

Diametrically opposed to this archaizing tendency is the wholesale rejection of traditional values and enthusiastic adoption of Western technol-

6. Andreas Lommel, "Der Cargo Kult in Melanesien," *Zeitschrift für Ethnologie*, LXXVIII (1953), 17-63.

7. Mooney, *op. cit.*, pp. 663-68.

ogy. This attitude may be combined with the most rabid xenophobia, as is proved by Oceanian occurrences in the last decades. The so-called cargo cult centers in the dogma that boats amply laden with all the white man's goods and contrivances are about to deliver their freight for the benefit of the natives, who in some islands have eagerly constructed sheds to store the wares on arrival. But this is not tantamount to welcoming the whites; it is solely appreciation of their civilizational equipment. As Lommel pithily puts it in his compendious survey: "The natives henceforth wish to live like the whites—even though without them."⁸

Striking as this craving is, it seems a local, distinctly Oceanian development in this form; hence it is of lesser theoretical significance than the iconoclastic repudiation of precisely the holiest part of aboriginal ideology. Under the influence of an innovating messiah this phenomenon, with or without *political* nativism, has been noted in Asia, Melanesia, and North America. In 1904 a prophet arose in Tanna Tuwa (Outer Mongolia) who harangued against both the ancient beliefs and the Russian intruders; his adherents were to throw all shamanistic drums into the fire and put a stop to their sacrifices of beasts. In Melanesia bullroarers—slats swung through the air from a thong so as to produce a terrific noise—rank as sacrosanct; and no social law is more rigidly observed than the exclusion of women from esoteric rites in which bullroarers and masks are employed. Yet these inveterate notions and practices are precisely those flouted by some of the prophets. In Bougainville, for instance, the men demonstratively showed the women the masks used at masculine initiation ceremonies. For a counterpart among the Ojibwa (Lake Superior), Mooney quotes sources dating back to the early nineteenth century.⁹ At that time both violently revivalist and iconoclastic tendencies came to the fore in that region. On the one hand, a prophet's messengers heralded the restoration of the old ways, as already described for the Delaware. On the other hand, the Indians were ordered "to throw away their medicine bags. . . . It is said that the shores of Lake Superior . . . were strewn with these medicine bags." Anyone who even within the last forty years has watched the reverent handling of these sacred bundles by their owners must stand amazed at the possibility that any messiahs could arbitrarily effect what in 1810 must have been for many an excruciating spiritual sacrifice.

It is perhaps more startling for us, though not from the aboriginal point

8. *Op. cit.*

9. Otto Mänchen-Helfen, *Reise ins asiatische Tuwa* (Berlin, 1931), p. 96; Lommel, *op. cit.*, p. 35; Mooney, *op. cit.*, pp. 677 ff.

Primitive Messianism and an Ethnological Problem

of view, that native leaders were again and again able to exact the senseless destruction of material values. Thus, in 1932 the fiat of a messiah put a stop to pottery-making in the only settlement on the island of Buka where the craft was practiced. With equal arbitrariness the same leader decreed a massacre of pigs; we have already encountered the parallel destruction of South African herds of cattle, idolatrously beloved as they were by their owners. Correspondingly, the Ojibwa had to put to death every one of their dogs.

These instances of iconoclasm are again obviously independent of one another. We cannot suppose that apostles of the Ojibwa prophet who had bidden the destruction of medicine bags in 1808 caused the Tanna Tuwans to burn their drums in 1904 or that the killing of Ojibwa dogs served as a pattern for the wholesale slaughter of Bantu livestock. The only possible interpretation is that in conditions of mass hysteria a man of strong personality can impose his arbitrary will on fervent believers in his mission. Conscious of his power, he will test his influence in given circumstances by substituting for the role of revivalist that of a deliberate spurner of the ancient ideology. The resulting inversion may then lead to striking resemblances in detail between remote peoples. Although I lack evidence on the other areas in question, it is worth noting that the implied topsy-turvydom is in a measure prefigured in the buffoonery of many North American tribes. Saying the opposite of what one means has been described as the most usual form of Pueblo humor. On another level, Plains Indian clowns will act "by contraries," ignoring the dictates of common sense. Members of the Heyoka society of the Dakota Indians used to express joy by groans and pretend to perspire from cold and to shiver in the heat.

In an earlier part of this essay I have insisted that the clash of diverse cultures is not the sole antecedent stimulus of messianism. This proposition is in fact a direct corollary of the inference drawn both by Americanists and by Oceanian specialists that movements of the same general order had preceded contacts of indigenes with peoples of higher technological equipment. What, then, were the conditions to be remedied by a pre-Caucasian savior? The answer is furnished by the prophet cults of the Apapocuva-Guarani (Paraguay and southeastern Brazil).

The Apapocuva band of Guarani had a deep-rooted belief that the world was to be annihilated. From a gloomy but impressive myth we learn that fire and flood will at some time overwhelm the worn-out earth. Darkness will descend, and the Blue Tiger will devour mankind. It is in order to save their people from this *Götterdämmerung* that through-

out the nineteenth century and as late as 1912 one shaman after another has appeared, professing ability to lead the Guarani to a secure haven, an earthly paradise, which was usually located beyond the ocean. Hence originated many migrations of the same band over long distances to the sea. "The dead we shall all see again," says the myth. Failure in one enterprise could always be explained by a ritualistic error committed by some tribesman, so that a new leader would find a receptive audience. Singing and dancing were the means for bringing about the desired end; as usual, skeptics were to be transformed in this case into vultures.¹⁰

To these Apapocuva data those unearthed by Spier from early records about North American Plateau Indians form an obvious parallel. The senescent earth, menaced by a deluge, requires renewal; there is to be a reunion with the dead; skeptics will be annihilated or transformed; salvation is to be achieved by dancing. The messiahs of this region were possibly of humbler stature than their counterparts elsewhere, but the underlying principle remained; the several deliverers had each a revelation, and it was through the special dances and songs taught them by their supernatural mentors that they hoped to save their people. A suggestive detail is once more the total neglect of everyday chores by the votaries of the cults during the periods of mass hysteria: "no one hunted, fished or gathered. They simply danced, all day and every day."¹¹

Once more we find parallels that cannot be accounted for on the theory of diffusion.

The phenomena of aboriginal messianism furnish rewarding material for discussions of a different order. As previously hinted, the migration of the cults involves more than a mechanical borrowing of this or that doctrine and ritual. Quite spontaneously and unintentionally substitutions and eliminations occur because a people cannot but re-pattern a cultural loan in accordance with its traditional norms. To take a trivial example, the Paviotso have "five" for their sacred number instead of "four," which plays that role farther east. When the Plains Indians took over Wovoka's gospel, they automatically made the corresponding changes in ritualistic performances. Not for lack of interest but solely for the sake of clarity I have refrained from entering this field of "cultural dynamics" so as to concentrate on a single issue. On the present theme, however, a few additional remarks seem indicated.

10. Curt Nimuendajú, "Die Sagen von der Erschaffung und Vernichtung der Welt als Grundlagen der Religion der Apapocuva-Guarani," *Zeitschrift für Ethnologie*, XLVI (1914), esp. pp. 287, 318-20, 327, 399.

11. Spier, *op. cit.*, pp. 7 ff.

Primitive Messianism and an Ethnological Problem

When balancing the odds for and against diffusion, many scholars have erred in dealing with the problem too abstractly, as though all traits could be regarded from the same point of view. Only a little reflection is needed to expose the fallacy. Culture comprises an enormous diversity of items. There are some technical achievements that cannot possibly have occurred over and over again. To take a metallurgical instance, men could not invent bronze, an alloy of copper and tin, unless they had access to tin, which has only a limited distribution in the world. Apart from that, there is the intricacy of the procedure involved in producing the alloy. Although we may not go so far as to assert that there could have been only a single center in human history for the dispersal of this metallurgical technique, we shall certainly reject the view that it has been hit upon independently in more than a very few spots. Even what the layman regards as a very simple craft, such as pottery, often has pitfalls for a practitioner that make its routine practice anything but easy; hence its earliest invention must have been tremendously difficult. In 1919 a young Swede tried to make earthenware vessels according to the ancient pattern and repeatedly failed. A successful potter has to get clay of the proper consistency, knead it, mix it, dry it, and apply uniform heat to a nascent vessel. It is not merely a matter of molding a lump of mud; unless properly fired, the material will relapse into a mere lump. It is for reasons of this sort that everyone now believes that much of the indigenous pottery made in North America stems from a single center in or near Central America.

But it is otherwise with a host of cultural elements that fall into a different category. A dice game, polygyny, a division of society into two units, are neither necessarily restricted to particular geographical environments nor the result of exceptional manual skill or of prodigious intellectual effort. Their occurrence may of course be linked with such oddities that the combination is best explained as going back to one origin, but in and of themselves they may easily spring up repeatedly in disconnected areas. The notion of a deliverer from alien tyranny evidently falls into the same category and with the same qualification. A pessimistic view of human destiny may be less obvious, but it seems abundantly warranted by the vicissitudes of life; and the urge to escape an evil fate is rooted in the general desire to survive. Thus, the occurrences of messianism are in part explicable as mutually independent phenomena. But, whether such interpretations by vulgar psychology seem adequate or not, the fact cited prove empirically that independent evolution has sometimes taken place.

NOTES AND DISCUSSION

Harold Orlans

SOME ATTITUDES

TOWARD DEATH

Death is terrible to Cicero, desirable to Cato, indifferent to Socrates.—MONTAIGNE.¹

The massive literature of modern psychology, which embraces so many important and unimportant subjects, fails conspicuously to deal with one fundamental human problem—many would term it *the* fundamental human problem—death. Why, when there are libraries of books on every aspect of normal or abnormal character in infancy, childhood, adolescence, adulthood, and (more recently) old age, is the human adjustment to death ignored? An essay by Freud,² several articles by Schilder,³ a volume by Anthony,⁴ and a few other scattered papers virtually exhaust the scientific literature on the subject. Does the vain Faustian spirit, searching ever

1. All quotations from Montaigne are from the Trechmann translation.

2. Sylvia Anthony, *The Child's Discovery of Death* (New York: Harcourt Brace & Co., 1940).

3. Sigmund Freud, "Our Attitude towards Death," *Collected Papers*, IV (London: Hogarth Press, 1925), 304-17.

4. Paul Schilder, *Goals and Desires of Man* (New York: Columbia University Press, 1942), pp. 61-110.

Notes and Discussion

for the light, fear to examine the heart of darkness? Or has society, unclanking sexuality, put death in its place as a secret rite not to be discussed in public? Has psychology, like so much of physics, become a kind of dignified engineering, forsaking truth for utility and therefore disinterested in a matter about which nothing can be done? Or is it felt that inquiry can disclose no more than what has always been known—that all men are mortal?

By itself, this article can hardly rectify such a long-standing condition. However, it does indicate that an empirical approach is possible in an area traditionally consigned to poetry, philosophy, and theology. These disciplines have made an indispensable contribution to man's conception of death; but the poet's sensitivity, the philosopher's intelligence, and the theologian's passionate humility can be fruitfully supplemented by a collection of prosaic facts viewed with a modest objectivity.

The facts which will be reported consist of 530 personal statements, ranging from a few words to many pages, in the London files of Mass-Observation. An organization of sociologists whose independence of academic circles has had some refreshing consequences following their work, Mass-Observation operates with a panel of two thousand individuals throughout Britain who voluntarily reply to questions mailed them each month.

The precise composition of the panel in May, 1942, is not ascertainable, but the 530 returns used in this article break down as follows: 60 per cent male, 40 per cent female; 70 per cent under forty years, 28 per cent over forty, 2 per cent age uncertain (no significant difference in age obtaining between males and females); 55 per cent from the "country" (places with 20,000 inhabitants or less), 33 per cent from "towns," and 12 per cent from London. It may be surmised that panel members were better educated, more vocal, more middle-class, and perhaps more intelligent than a representative sample of the national population. The 530 returns in a canvass of two thousand is normal for Mass-Observation surveys; that some further social or psychological factors distinguished respondents from non-respondents is likely, but their nature is indeterminable.

In May, 1942, panel members were asked: "What are your own personal feelings now about death and dying? Do you think about it much, occasionally, or hardly at all? Has the war had any effect on the extent to which you think about it, or your general feelings about it?"

The questions were not cordially received by some, who dismissed them

briefly and frankly. "Death," writes a subway-station attendant, "is one of the subjects at which my mind tends to 'job.' It's also 'taboo' as a topic of conversation in all my immediate circle of friends." A young woman confesses, "I have always had a tendency to shy from any discussion and hastily to switch my thoughts in other directions." And a soldier writes, "I try to think as little as possible about death and dying." But to strive to avoid a subject is not to be indifferent to it or even to be successful at avoiding it. "I excuse myself, with apologies, from answering this one," a woman writes, "having been suffering for the past few months from an abnormal state of mind and abnormally preoccupied with ideas about death." Consciousness can be a sword which cuts the hand that wields it.

How often do these people think about death? Replies range from "always" ("the thought of death is always present to some extent and degree"; "I have thought of death practically every day of my 'life' from early childhood"; "constantly"; "almost without ceasing") to "never" ("I never think about death or dying at all"; "I can't say that I ever really think about it"; "never give it a thought"). The categories "much," "occasionally," and "hardly at all" given in the question were not defined, and respondents often substituted terms of their own. Any statistical analysis, therefore, is bound to be of limited value, but, for what it is worth, we analyzed 155 of the most definitive responses.

These suggest a tendency for women and older persons to think most often about death. (No significant difference in frequency of thoughts of death was noted between inhabitants of towns and country.) The former finding correlates, on the social level, with the greater interest of women in organized religion and, on the psychological level, dare one say with their greater vanity? A friend indignantly counters that men are more vain and makes the plausible suggestion that women think more about death because their functions as mother, housekeeper, and nurse bring them into more intimate contact with it. This, however, is another sociological explanation. There should also be a psychological explanation, though we may not have hit upon the right one.

The latter finding, that older persons tend to think most often about death, while hardly surprising, requires qualification. Our group includes no person younger than perhaps sixteen and so provides no direct evidence on the thoughts of children. Retrospective accounts, however, as well as empirical studies of children, indicate that childhood and adolescence are often periods of excessive preoccupation with death, which diminishes

Notes and Discussion

with maturity and may return with old age. Thus a man of thirty-five writes, "These moments when I have really thought about my own death are rarer than they used to be. They were most frequent between the ages of fifteen and twenty but have occurred since I was about ten years old." A woman over forty says, "I do not think about the subject so much now as I did when I was a child—when I had rather a marked fear of death." And another elderly woman says, "Latterly I have thought less about death than at any time during my life. . . . It was never absent from my thoughts as a child and girl." The child discovers death in the course of his scientific inquiries into the nature of his world, but, because of his limited experience, the discovery remains intellectually perplexing and, being irreconcilable with his magical notion of self, a frequent source of emotional torment. Maturity brings the experience required for understanding death, but also the opportunity to disregard it, by way of work, love, sport, and every conceivable activity. Age restricts activity, obliging introspection to be borne as best it may.

Yet conscious thoughts of death are but the core of a penumbra which envelops the matter in the mind. A young woman writes:

I do not think of death, and yet it is at the back of my mind almost all the time. Not in conscious thought but like a shadow which is cast by things. I once heard or read a line somewhere—"Look your last on all things lovely every hour." That's what it is. I *know* all the time that I must look my last. Sometimes, apropos of nothing, when I am picking primroses in the woods, listening to music, bathing in the river, drinking coffee . . . there comes this sudden pang, and I feel as I did on the last day of holidays before going back to London and school.

And a young man:

The idea of death has for many years been constantly with me, not in any morbid or religious sense but as a moral incentive to live as though each day were my last. . . . It merely means that I should like to leave my affairs in order, the daily task accomplished, wrongs, conscious or unconscious, righted, friendships intact and no ill-feeling anywhere.

Similar feelings are undoubtedly common—so common one cannot undertake to trace their range, for they merge with aspects of remembrance and anticipation, morality, art, and the most ordinary perception of things and events.

Death comes always to others. If the two billion men on earth have an average life-span of fifty years, over a hundred thousand die every day.

The death of strangers is not even common—it is axiomatic and evokes no interest; for a thousand deaths of a thousand men, a thousand children, one substitutes a concept, a word. Few events affect us less. But if, in this primordial deluge of death, a single case be momentarily observed, strong emotions can disturb the bystander. A woman writes, "The night before an execution is usually one of acute nervous misery for me . . . and I am conscious of shock caused by the ir retrievable and irrevocable nature of the punishment. It is *too much*."

It is difficult to estimate the effect war had upon such general attitudes. More women than men, and more people over than under forty, say that the war increased their thoughts about death, but the majority maintain that it had no effect. It seems that war altered the frequency and intensity of thought more often than it changed its nature. "I don't think the war has changed my feelings; it has made them stronger," one man writes, and others repeat his words. Many people, especially those fully immersed in the war, became more fatalistic, indifferent, and callous. An officer in the Royal Air Force writes:

To me Death seems a very much less serious matter than it did. At lunch you talk to Jimmy; at teatime you are told that he has been killed. The first time it happens you are shaken; by the twenty-first time your brain registers the fact and then somehow prevents your senses being shocked and forbids memories to appear. Also you know that Jimmy is dead, but as far as you are concerned is he more dead than if he had flown to China by air and left there?

But it is impossible to summarize adequately the complex, multitudinous, and changing emotions that war nourished. In many cases not callousness but heightened sensitivity developed. An elderly woman states that "the thought of the death of the young people which is going on all over the world . . . and the death in torture and agony of those in the occupied countries make me suffer so much I cannot bear to listen to news about it or to think about it all."

The death of one's self is quite a different matter from the death of others, and one suspects that dwelling upon the latter subject often serves to exorcise the former. One may become compulsively preoccupied with the death of others:

I have a morbid habit of picturing the death of a beloved friend or relative and from that trying to imagine my reactions.

Notes and Discussion

As a child I dreaded my mother's death—I used to run home from school half-terrified lest I should find her dead if she merely had a headache.

I am not afraid of dying myself . . . [but] I am absolutely terrified of anyone I am fond of dying. . . . I would much rather be killed myself than lose anyone—and often feel that I would definitely become suicidal if I did lose my husband or my brother or sister. I seem to have no control over my emotions where this is concerned.

One may strive to avoid the subject:

Since the war I have made an effort not to think about death being always round the corner, which has been largely successful.

In the daytime hours . . . I hardly ever think of it—I have sufficient mental control not to.

Or the attempt to think about one's own death may be defeated by the blind strength of the ego:

Your question makes me realize that I cannot even imagine dying. . . . When I do think about it or discuss it with anyone in the comfortable light of day, my feelings are a mixture of curiosity, apprehension, and disbelief. . . . Everyone has a sneaking and quite irrational idea that, though everyone else can die, they somehow never will. When I was a child, I was convinced of this.

My own death. . . . I find it extremely difficult to think about. It does of course come to mind now and then casually and in conversation, but in these casual references I make to it in thought and conversations the idea of my death is not there in the real actual form that it is sometimes.

But ultimately, at one time or another, and in one form or other, thoughts of death turn back upon the self from which they come.

The last thing we would suggest is that there need be any overriding harmony or consistency about these thoughts within any one person and still less among individuals within a society. The unity of a man must encompass all his moods and disabilities; of a society, every sectarian enterprise; nature readily tolerates complexity, paradox, superfluity, confusion, error, conflict, stasis—and death. One is struck, in these testimonials, by the contradictions, ambivalence, and vacillation that characterize the individual's thoughts of his death. To the same person, death can appear both pleasant and terrifying, abhorrent and desirable, tragic and triumphant, awesome and repellent. Here are four examples:

Death is as completely necessary as birth—it is something natural, unavoidable, and therefore not unpleasant. . . . The idea of being screwed down in a box and buried—and there being left to rot—terrifies me.

An apprehension of an early death gave rise until comparatively recently to fears on this account. . . . Perhaps youthful sentiments of the joy of life, of love, and of one's associations have represented death as something hideous and abhorrent. . . . Now I see it as something quite as natural as sleep, and I can imagine that at least it must approximate to the beauty and tranquillity of sleep.

Two sets of feelings about death and dying. Which set I favor depends on circumstances and digestion. First and most usual feelings are that death is rather tragic. There is so much of interest in life that it seems a great pity to lose it. . . . The second set of feelings is opposite to the first. . . . When I feel that life is a tragedy, then death becomes not very unwelcome. Life seems on these occasions so futile, so short in duration, so full of trouble, frustration, ugliness, and so on that to lose it would be no loss.

Generally I prefer *not* to die yet (particularly as it would distress my wife, who is a semi-invalid and largely dependent upon me). But I am ready to die. . . . At times the notion of being *blotted out* quite overwhelms me; at times the idea of *eternity* bewilders me; but, generally, I am reconciled, with perhaps a touch of cynicism—"What's the use of being anything else."

Fear is often taken as man's primary reaction to his death. We shall start our chronicle of these reactions at the opposite end of the scale, where death is welcomed or anticipated with pleasure. Montaigne writes:

I have seen one of my intimate friends forcibly courting death with a real affection, that had become rooted in his heart by diverse specious arguments that I was unable to refute; and, as soon as it presented itself crowned with a halo of honour, rush at it with fierce and ardent hunger. . . . If I were here to string together a long bead-roll of those, of both sexes and all conditions and sects, during the happiest ages, who have either awaited death with firmness or voluntarily sought it, and sought it not only to flee the ills of this life, but some merely to flee the satiety of living, and others in hope of a better condition in another place. I should never have done.

The individual believing in immortality affords a prominent example, and a third of the men and almost half of the women in our sample say that they believe that death is not the end of life. One cannot know what proportion of these replies represents convention and what conviction, or which conviction is founded upon calm and simple faith and which upon

Notes and Discussion

anxious hope. The firmest conviction of the intellect may yield, *in extremis*, to the firmer conviction of the body: it is said that there are no atheists in foxholes; and, in the ninth hour, even Jesus cried out "Eli Eli lama sabachthani?" Nevertheless, we are left with such declarations as this, from a sixty-four-year-old man:

I assume I am not so very far from the great change. . . . I have entire confidence in the continued existence of myself as a self-conscious intelligence but little changed as to character, knowledge, or perceptions by dying. . . . I think about death . . . with the calm expectancy of entering a good rest and holiday free from the cares of maintaining my physical body and its paraphernalia.

And a young man:

My own personal feelings about death are that it is just another form of life to which I look forward with great interest and pleasure. The human body is a convenient form for our earthly existence, but when it dies we (that is, our mind, or understanding or soul) do not. . . . If I knew I had to die tomorrow I should be quite happy about it.

To those convinced of immortality, death promises a continuation of the pleasures and the vanities of life. But there are as many or more who look frankly at death as annihilation, and love it therefore. "I have occasionally felt I would welcome extinction and the release from the worry and fear of insecurity in my old age," a woman of forty-nine writes. With another woman, this passing feeling has become a firm resolution: "Death is the end, one just goes out. . . . I pray it may come soon, as I dread old age and helplessness, already my eyes and ears are giving out, a cataract growing. I long to be dead." And a cancer victim writes:

Death, to me, is release from pain, like eternal rest, the end of all. . . . When I am having the agonizing headaches from which I suffer . . . I become semi-conscious with intense pain and sink into a horrible pit of smothering blackness, from which I must struggle back to life. At these times I think of death as a welcome friend.

The sick and aged express openly thoughts which most persons harbor in difficult times—that, as Montaigne says, "death can, when we please, cut short and put an end to all other discomforts. . . . This is the true and sovereign freedom, which enables us to snap our fingers in the face of violence and injustice, and to laugh at prisons and chains." Then the hosts of the dissatisfied and unhappy regard death fondly. "As an adolescent I was so bitterly unhappy that I used to cross off each day on the calendar

at night and inwardly ejaculate, 'A day's march nearer home.' " And, Keats-like, some of the very happy join their numbers: "I have known moments of extreme happiness when I would really like to die so as to 'end up on a pleasant note' as it were."

A young woman declares: "I have found great comfort in the thought that my life would end sometime. Eternity to me is a cold, unfriendly thing, and I would hate to live forever." And an elderly woman: "The thought of being dead, i.e., finished, often attracts me very much. I have no desire to survive in any way, not even in anyone's mind." A young man states: "For some reason which is not quite clear to me the idea of the survival of the individual in some other form after death is quite repugnant to me. Death, surely, must be a complete extinction of the individual, both body and mind." A woman of fifty-three: "I think that, before my time comes, I shall be tired enough to slip out without much struggle. And I have no fear of, nor desire for, an after life." And a sick girl: "I do not think I shall live to be very old, nor do I want to. I often feel so tired, and then I think it would not be bad to die tonight. . . . I am always so tired, I think if I were dead I would be left alone and no one could expect me to do anything."

A surprising number of people write in this vein. The word "tired" recurs often in their accounts. Life is a heavy burden for them, and death the only way to set it down. Many are tired not so much of the relentless daily routine as of themselves; from routine they might escape. Immortality would constitute a sardonic punishment for them, who wish so much, as one puts it, "to be done with a self I have never been content with."

The idea of carrying on my own personality is . . . rather repugnant.

If I had any hand in the arrangements, death would end everything, and there would be nothing of the being I call *me*. . . . If, after death, any of *me* remains, and . . . I have to give another far longer turn on another stage, I shall be annoyed.

Next to those who relish the prospect of death may be put those who merely look at it indifferently, without pleasure or fear. A common enough attitude to death in the abstract, this is a rarer reaction to death in the concrete. Montaigne expresses it: "I looked upon death with indifference when I saw it in a general way, as the end of life. I master it in the lump; in detail it worries me. The tears of a lackey, the disposing of my old clothes, the touch of a well-known hand, a commonplace word of

Notes and Discussion

comfort, make me soft and sorry for myself." But it occurs occasionally in our material, particularly among the old:

As those faculties lose their efficiency, a feeling of resignation creeps into one that the job is ended and it is someone else's turn.

I had a long illness in 1933-35, and I came gradually to seeing [death] . . . without distress coming nearer to me. I would then have died quite naturally, as one breathes.

Being sixty-eight years old . . . by the time this war is finished and the mess is cleared up, I expect to be dead. I have a faint regret . . . [but] I have had my share of life. I don't want to die particularly, but I should not feel any particular urge to live.

Montaigne noted the indifference which many men display at their own death:

How many of the people we see led to their death, and that not a simple death, but attended with ignominy and sometimes with cruel tortures, and exhibiting such assurance, the one through stubbornness, the other through a natural simplicity, that we may perceive no change from their ordinary demeanour; settling their domestic affairs, commending themselves to their friends, singing, preaching, and talking to the people, nay, sometimes jesting and drinking to their acquaintances, as cheerfully as Socrates.

A man who was being led to the gibbet said "for goodness sake don't go by such and such a street, where I shall run the risk of being collared by a tradesman for an old debt." Another entreated the hangman "not to touch his neck, for he was so ticklish he would shake with laughter."

La Rochefoucauld has said: "One can no more look steadily at death than at the sun" ("Le soleil ni la mort ne se peuvent regarder fixement"). Indifference can be a consequence of this inability, of mature wisdom, naïveté, stupidity, or simply of other preoccupations.

We were surprised to note how many considered death a personal insult. "I should be more angry than fearful if I was told I only had another six weeks to live," one soldier writes. And another: "I know that after death I shall not count, and this is infuriating." A young man: "I resent (rather than fear) the idea, because there are lots of things I want to do and know and in particular I want to know what's going to happen." A man recalls that, as an adolescent, he was "violently antagonistic" to the idea; it seemed "maddeningly incomprehensible" to a woman. An old man says:

"I hate the idea of death and all connected with it. I hate passing a funeral. I hate going to cemeteries, and I hate thinking that my friends will die."

"I don't like death, and I don't want to die." "I regard the process of dying with fear and repugnance. It is associated with terror, pain, agony, and grief." Thoughts of death are "terrifying," "agonizing," "depressing," "morbid," "repellent"; one's death is "an unpleasant subject," "a melancholy fact," "lonely and isolated."

I cannot think about death with fear or despondency.

The thoughts of death honestly terrify me. I cannot reconcile myself to the thoughts of dying; nights I lie awake and cry bitterly because life seems so very short and the things I want so very very much to accomplish . . . recede farther and farther into the distance.

An old man, a retired clerk suffering from bad eyesight, writes:

Dying is constantly before my mind. . . . I am only sixty-six, but to think I have only thirty-four more Junes with their vivid green fields, young foliages, and blue skies, and the sun's friendly warmth, fills me with alarm. *Dying!!!* Good God. *Why?* I live a simple, good life, love my meals, *live alone*, contemplate, understand music, have a slight taste for poetry, have insatiable thirst for philosophic fundamentals (the truth) and am full of worries. *Die!!! Why???*

We all die too soon. I've got back into good condition and am doing physical jerks. I've an awful lot to think about and to do. No thanks, dying's not in my line and I don't think it is at all essential for a long time (with the aid of homeopathy). But if Hitler sends over to bomb our kids in reply to our *avowed* bombing of theirs I might get hit in mistake, and have to suffer obliteration goddamnit, and it would be a pity.

And death is filled with terror:

When I was a child . . . I had a fear of death and used to wake up at night in horror, imagining pain which I thought meant I was dying.

When I was very young, I used to wake up in the night and really feel afraid of the strange idea of dying—the inevitableness of it, that I *must* die one day—and it used to make me feel very frightened.

I have always been conscious that I am afraid of death. Occasionally, at night, if I concentrate on its inevitability, I produce a paroxysm of physical symptoms—rapid pulse, sweat, nausea."

A few of our informants assert, in the words of one, that "it is of being

Notes and Discussion

dead I think, not of dying." Most, however, draw the opposite distinction between death and dying, as the following quotations illustrate:

I long to be dead but dread dying because it must always be painful.

I'm not afraid of death as much as dying.

My own death does not appear as a calamity to me. I have no fear or uncertainty about it, as I think that death is the end of all consciousness and existence. . . . Dying is a different matter. . . . I don't like to consider the numerous unpleasant ways of dying which threaten people in these times.

"It is not death that troubles them," Montaigne remarked, "but very much the dying." This curious and persistent distinction is attributable, perhaps, to the fact that dying is a condition of which the individual can readily conceive, by likening it to some previously experienced condition such as sickness, sleepiness, fainting, physical or mental anguish; but the insensibility of death is inconceivable. Freud observed that "our own death is indeed unimaginable, and whenever we make the attempt to imagine it, we can perceive that we really survive as spectators." Many dying persons have recovered and reported their sensations; with the dying there can be communication—indeed, it can be said that all men are engaged in a prolonged process of dying. "The hour which gave us life begins our death" (Seneca). But the dead are incommunicado.

This concern with dying as opposed to death is reflected also in the frequent statement that pain and injury is more feared than death:

I am not afraid of death but am decidedly afraid of being hurt.

Fears of accidents involving broken limbs I am much more concerned about [than death].

On the whole I am much more apprehensive [in air raids] of being injured than killed.

I am terrified of being maimed. . . . I have more fear of losing my hands . . . or sight than of losing life.

Instantaneous death in any form I don't mind, but all this fear of suffering, of being maimed or developing paralysis, crippling arthritis with its blindness and pain, of being blitzed and shell-shocked or having an accident which leads to loss of limb and lasting pain.

We persist in our effort to give a psychological interpretation of such statements—that mutilation injures the image of the body's integrity and of the ego's mastery, whereas sudden death preserves it; or a sociological explanation—that cripples are objects of pity and dependent upon others, whereas the dead are honored. But we dare not assert that these statements are less rational than our analysis and that they do not represent a choice based upon observation as objective and logic as good as our own. It is vanity for the analyst to think his understanding superior to that of his informant; it is merely somewhat different, because it serves a different purpose and/or addresses a different audience.

A good deal of time is evidently devoted to speculation on the manner of one's dying, and strong preferences are expressed for one form as against another. For Montaigne:

Death assumes shapes of which some are easier than others, and takes on different properties according to each one's imagination. Among natural deaths that which results from weakness or stupor appears to me gentle and pleasant. Among violent deaths I can less easily fancy falling down a precipice than a ruin crushing me, and dying by a sword-cut than by a musket-shot. And I would sooner have drunk Socrates' potion than stabbed myself as Cato did. . . . So foolishly does our fear regard the means more than the end! It is but an instant; but it is of so much importance than I would willingly give many days of my life to pass it by in my own way.

The ideal way of dying for most of our informants is suddenly or in their sleep, the object being to avoid pain and fear and to preserve the body intact. Where the two goals cannot go hand in hand, the latter will generally be sacrificed to the former, as in the choice of a violent but instantaneous over a protracted death.

The dislike of a death accompanied by bodily injury has already been mentioned. Several soldiers express their aversion to being crushed by a tank or bayoneted; civilians, to a "messy" death like being run over by an automobile. A Catholic woman who, for religious reasons, regrets the recent sudden death of her gardener, nevertheless says that she "would rather fall down in the sunshine with my face pressed into a flowerbed than be run over by a bus in Oxford Street." A young man feels "nauseated . . . when brought into contact with the fact of violent death." Montaigne says: "Although it all comes to the same thing, yet my imagination sees as much difference between leaping into a fiery furnace and into the channel of a shallow river, as between life and death." He goes on to describe a public execution in Rome, at which a man "was strangled with-

Notes and Discussion

out the spectators exhibiting any emotion; but when they came to cut his body in pieces, the hangman dealt no blow that the people did not follow with pitiful cries and exclamations, as if every one had lent his own sense of feeling to that carrion."

We surmise that preservation of the body supports these individuals' vanity and their unconscious conviction of immortality. The attitudes which prevail in the present group are, however, by no means universal, being rooted in each instance in the character of the individual and of his society. It is well known that suicides often fasten upon a congenial mode of death to the exclusion of others that are more convenient—the man who has chosen gas will not use a knife, and the one who has decided upon a gun will not drown himself. The sword Montaigne feared did not deter the Romans and Japanese; the Indian widow did not fail to leap upon her husband's funeral pyre; while custom leads the Tibetan to cut the flesh from his friend's corpse, mash the skull with stones, and feed it to hovering vultures.

Montaigne reports: "Caesar, when asked what death he thought the most desirable, replied, 'The least premeditated and the quickest.'" Most of our informants who discuss the subject voice the same opinion:

I should hate to die in a hospital from some slowly creeping disease. I should like to die suddenly while still carrying out my normal activities.

I often wonder what sort of death I will have, whether it will be slow and painful (which is what I dread) like cancer or tuberculosis, or quick and sudden like a road smash.

I'm terrible strong of heart and lungs and shall take a fearful lot of killing. My mother took a year, and she was eighty-four. I might live to be ninety. Terrible prospect. I think of it pretty often and wish for a sudden death.

The war and aerial bombardment stimulated fears of new kinds of lingering death: "I have a special dread of being trapped under a building in a raid and dying from starvation or injuries." A boy of eighteen hopes to "die peacefully in my sleep, or instantaneously. I should very much hate to die of cancer, of strangulation, or poison gas, or with dozens of bullets or bayonet wounds in my stomach." A young soldier writes:

Sometimes . . . at nighttime in bed, I will start involuntarily thinking about myself being bayoneted, and taking two or three conscious or semiconscious days to die, being in too much pain to scream. . . . Then I think of drowning, of being run down by a tank, and of being gassed. . . . Then the realization will come upon

me how extremely likely it is that something of the sort will happen to me, and I have a strange feeling in my stomach, and I might perspire a little. Then I start thinking of how I can avoid it and then, that after that, when I die I stand a moderately good chance of dying quickly, or of accelerating my own dispatch, and with that I go to sleep.

Religious persons are a notable exception to the general desire for a sudden death. A recent convert says, "I fear sudden death now, which once I regarded as the best form of dying, and I can fully appreciate the petition in the Litany asking for deliverance from it." And a woman of twenty-five, cited previously:

As a Roman Catholic I believe that there is life after death. . . . I would like to die in my bed and not too suddenly. My religion provides me with various helps to dying, and I should like to make use of them. About ten days ago our gardener fell dead on the lawn, while mowing, and though when I reached him a few moments later he looked not unpeaceful, I decided it was too unexpected to be wished for. Many people, when they spoke to me and commiserated with his widow, remarked that it was such an "easy way to die," and his widow said she was glad he hadn't suffered, but, for myself, I would rather have a little suffering and time to get used to the idea of my own death.

Somewhere in *The Seven Pillars of Wisdom* T. E. Lawrence speaks of the Arab's preference for a slow death in which a man has time to compose his mind and achieve a spirit of resignation. It suggests an attitude that is not common in the West.

The Roman Canius Julius, Montaigne tells us, awaiting his execution, was asked by a friend what were his thoughts. "I was thinking," he replied, "to hold myself ready, with all my powers bent on seeing if, in that so brief and fleeting moment of death, I can detect the flitting of the soul, and whether it has any consciousness of its going." Our subjects are attentive to the very same problem:

I wonder what it must be like that split second before you snuff out.

I have wondered whether there are any last moment sensations when H.E. [high explosive] is dropped in close proximity; whether there is time to feel one's body violently disintegrating in the explosions before unconsciousness.

The images they have formed of that moment are of blackness, amputation, unconsciousness, and a surpassing sleep: "the idea of death is . . . 'sharpness' and the blowing-out of my candle"; "just like the blowing-out

Notes and Discussion

of a candle"; "like going under an anaesthetic"; "like having an aching tooth removed"; "an indefinite sleep, only deeper and blacker"; "a state of unconsciousness, lasting for a long time." To die is "to pass out much as one goes to sleep at night, quite unconscious of the moment of going to sleep and without pain"; to die is "to lose consciousness, as in sleep, and forget that one had ever been alive."

Several persons report their reactions at moments when they were in imminent danger of death. A seventeen-year-old girl, awakened by a bomb dropping nearby, said to herself, "Well, in another second or so I'll know what it's 'All About.'" A woman states: "On one occasion I was run into by a motorcar, and in the brief moment of contact before I knew what was happening I was conscious of the thought, 'This is the end of everything.'" The accounts, often quite similar, recall again the concentration of *Canis Julius*; it is as though, at these moments of crisis, the personality were detached from the body and objectively observed its fate.

Once I was involved in a motorcycle accident, and thought I was going to be killed; my thought, as I saw the bonnet of a car on top of me, was strangely impersonal and amounted to a strange interest in what it would feel like to be killed and how my friends . . . would be informed. Only later when I was safely out of it did I feel fear.

A member of the Royal Air Force describes the same sensations:

Once I was very near death when an aircraft in which I was rear-gunner was crashing. For three minutes before we hit the ground we knew that we must crash and that there was about an even chance of living through it. Afterward I was surprised to find that I had considered dying quite objectively—as if I had been a third party watching the crash. I remembered thinking of those who had been killed before and thinking—"This'll be another"—and then wondering who would write home.

The constant dangers of war provoked numerous precautions against and preparations for death, but here, too, the individual generally remains strangely detached from his actions, which he performs because they are conventional or reasonable. His behavior seems to have objective but not subjective content. Thus, a woman writes:

The practical side of me recognizes that there is a possibility of death, so I have made a will, and told my husband to remarry as soon as possible, and even suggested my successor! I did all this in a detached sort of way, as though making ar-

rangements for someone else. The idea in my mind all the time was: this could not happen to me.

Others put the matter off, as does a housewife. "There are times when I think it would be wise to destroy old letters and papers, and make a will . . . so as to leave everything tidy and in order, but so far I've not got down to it." And there are those who sleep imperturbably through air raids:

I have been in about a dozen air raids in London and as many again in other parts of England but have always got into bed and slept through them, preferring to die in comfort rather than in an uncomfortable shelter. I feel that some extra precautions taken to avoid possible death offer so little extra security that they are not worth bothering about.

Our subjects display the most varied ideational adjustments to their impending death: some accept mystical ideas; some, the ideas of an orthodox religion; the ideas of others are materialistic, nihilistic, idealistic, or what-not.

There are cheerful ideas, like those of a life-member of the "Rationalist Press Association":

I have given the matter a great deal of thought . . . and there is no reason whatever for despair. I am quite cheery about it. . . . Life should be taken seriously but happily: then death is likely to be serious and happy for one's self too. . . . I am satisfied that I know all that needs to be known about it to be able to continue in happiness. I am also aware that it is not possible to explain the matter in fullness to others.

And an old man:

I expect to take my memory across the valley, and I shall be surprised if the information I have gained from reading will not be at least partially useful. . . . The facts of the existence of the subtle worlds I expect to inhabit after parting from my body, and their conditions and inhabitants, form the chief interest in my reading.

There are zealously religious ideas:

At one time I was scared of dying, [but] . . . I accepted Jesus Christ as Savior and King, and naturally death no longer has fear for me because it means entrance into the presence of Jesus Christ.

I believe in the orthodox religion and live my life accordingly, and I have no fear of death or think about it.

Notes and Discussion

And people cling to their ideas despite their contradiction by experience and reason: "I tend to believe in reincarnation. . . . I try to forget the physical side of death. . . . The terrible waste of young lives in war increases my faith in reincarnation." A religious girl describes a class discussion on immortality: "By the time the evening was over, we felt we had no logical legitimate grounds to believe in immortality, though we all hoped for it."

Indeed, one has the feeling that, whatever their nature—whether dogmatic or agnostic, exalted or depressed, abstract or mundane, simple or sophisticated—these ideas serve their bearers as magic talismans, defending their image of self from the chaotic world which assaults it unremittingly:

I'm convinced that I shall live to be eighty or more so that even the worst blitz doesn't give me that particular fear [of death].

[A soldier]: I've told myself so often that nothing can hurt me, that nothing can prevent me from returning to my wife and family, . . . that I really believe that I shall come to no harm.

I used to scare myself into a frenzy, . . . [but] I have cultivated such a philosophical attitude to death that I can forget it for very long periods and face its prospect with equanimity.

After a great deal of horror at the thought when I was young I have now come to feel there is no objection to death in its proper place, i.e., at the end of a useful life.

My general feeling of death is a fatalistic and philosophical one—death is every man's fate. . . . I needn't worry about it. . . . It is wasting valuable time and thought to think about it at all.

A few persons are very honest about the adequacy of their ideas:

As with so many of the major problems of our existence I have to admit that I have no very decided views. My experience is that most of us go through life without very definite opinions. We put off making up our minds about many important matters. I admit to this in my own case.

These people want to live to see the end of the war:

I feel I have a duty to keep alive now so as to play some part in the social reconstruction that should follow.

I almost consider it a solemn duty to live while there is so much death in the air.

Especially during the London blitz, I felt even more strongly that I must live through it, in order to look back on it in after life and fit it into the scheme of things and describe my reactions to other people.

One woman would "just like to live to see the end of the world." Death is disliked "because of the cut-off feeling: of not knowing what will happen next and how things will go on." Their affairs are not in order. This woman did not want to die, formerly, until she had children and, now, until they are fully grown. That man declares: "My desk and belongings are too untidy at the moment for me to wish for death until I put them right, and I should like to be able to leave among my things little notes for those who come after." The young soldier asks:

Is it really going to be *for* anything? Is the supreme sacrifice going to be for a supreme reason? Can one be sure of this? . . . If one was absolutely certain that one's life . . . was going to give the opportunity for the ideal new world to be introduced, one would feel more happy about dying. . . . I cannot rid myself of the misgiving that if I give them my life, which is my dearest possession and my last, "they" may just turn round and with a shrug of the shoulders like the man who has put your money for you with great promises on a losing horse, say, "Sorry, but things just didn't turn out that way."

How can one sum up this melange of thoughts, feelings, and actions of which death is the focus? Death is essentially a matter of biology and chemistry, like alimentation, growth, or decay; the death of a cell or an insect is as indifferent a phase of its nature as the bursting of a bubble in the froth of the sea; and thought and emotion are neither operative nor relevant here. Thought and feeling form a dream world which man inhabits, six feet above the ground, and which is of consuming interest to him. That the dream world has only a trifling effect upon the real world, which alternately sustains and dissipates it, is his misfortune.

A philosopher, R. G. Collingwood, begins a recent book by asserting that "all thought exists for the sake of action." On the contrary, man often thinks where action is precluded. This article affords an instance of that fact.

I want to thank Len England and Mollie Tarrant, directors of Mass-Observation, and Michael Lyster, who was with Mass-Observation when this study was undertaken in 1948, for their friendly cooperation in making available the material upon which this article is based.

UNITY OF PLAY:

DIVERSITY OF GAMES

So varied and complex is the world of games that there are many ways in which a study of it can be approached. Psychology, sociology, anecdotal history, pedagogy, and mathematics all share a domain whose unity ends by ceasing any longer to be perceptible. Works like *Homo ludens* by Huizinga, *Jeu de l'enfant* by Jean Chateau, and *Theory of Games and Economic Behavior* by J. von Neumann and O. Morgenstern are not addressed to the same readers, nor do they appear to deal with the same subject. Ultimately, this question arises: How much does one profit from the facilities or contingencies of vocabulary by continuing to act as though such different and almost incompatible inquiries are fundamentally concerned with a same specific activity? It is doubtful whether common characteristics permit one to define this specific activity and consequently whether it can legitimately constitute the object of a comprehensive study.

If, in the current experiment, the domain of games preserves its autonomy despite everything, this has obviously been lost as regards scientific investigation. This is not alone due to different approaches resulting from the diversity of disciplines. The data studied under the category of

Translated by Elaine P. Halperin.

games are so heterogeneous that one ends by presuming that the word "game" is perhaps only a snare which, because of its misleading generality, nurtures tenacious illusions regarding the supposed relationship between disparate lines of conduct.

There is some purpose in demonstrating what steps, what fortuitous chance, at times, have resulted in such a paradoxical division. In fact, this curious partition begins at the very outset. Whoever plays leapfrog or dominoes or flies a kite knows that in all three instances he is actually playing. But the child psychologist alone is interested in studying leapfrog (or in prisoner's base or marbles). Only the sociologist is interested in kites, and only the mathematician in dominoes (or in roulette or poker). I find it quite natural that the latter have no interest in blindman's buff or in tag, neither of which lends itself to equations. I find it less understandable that Jean Chateau neglects dominoes and kites, and I wonder in vain why historians and sociologists decline to study games of chance. To be more precise, in the latter case, while I but dimly perceive the reason that would justify such an exclusion, I readily suspect the motives that have led to this ostracism. As we shall see, they stem to a great extent from the biological and pedagogical preoccupations of scholars interested in the study of games. If we except anecdotal history, the study of play—which moreover concerns itself more with toys than with games—benefits in this way from the works of three independent disciplines: psychology, mathematics, and sociology, whose diverse contributions we will examine in turn.

I. HISTORICAL ANALYSES

For a long time the study of games was hardly more than a history of toys. Particular attention was paid to the tools or accessories of games rather than to the nature of the games themselves—their characteristics, their laws, the instincts they presuppose, the kind of satisfaction they procure. Generally speaking, they were considered simple and insignificant childish diversions. Therefore no cultural value whatsoever was attributed to them. Research into the origin of games or toys has only confirmed the initial impression that toys are tools, and games behavior, amusing and of no importance, relegated to children when adults have found better things to do. Thus, weapons that have fallen into disuse become toys: the bow, the shield, the peashooter, the slingshot. The cup and ball and the spinning top at first represented magical skills. Similarly,

Notes and Discussion

many games are based upon discarded beliefs, or they vacuously imitate rites denuded of significance. Roundelays or *comptines* seem to be ancient incantations no longer in use.

"Everything degenerates into play," the reader of Hirn, Groos, Lady Gomme, Carrington Bolton, and many others is led to conclude.

However, in 1938, Huizinga, in his major work, *Homo ludens*, maintains a theory that is the exact opposite of this: culture emanates from play. Play is simultaneously freedom and invention, fantasy and discipline. All the important manifestations of culture are derived from it. They are indebted to the spirit of research, to the respect for rules, to the detachment that it creates and maintains. In certain respects the rules of the law, of prosody, counterpoint, and perspective, the rules for stage settings and liturgies, for military tactics and philosophical controversy, are so many rules for games. They constitute conventions that must be respected in a determined domain where they establish nothing less than civilization itself. "Has everything sprung from games?" the reader wonders in closing *Homo ludens*.

The two theses are in almost complete contradiction. I do not believe that they have ever been compared with the purpose of arbitrating or of distinguishing between them. It must be said, however, that they seem far from being easily reconcilable. In the one case games are systematically pictured as so many degradations of the discarded activities of adults which, having lost their purpose, descend to the level of meaningless diversions. In the other, the spirit of play is regarded as being at the origin of the fertile conventions which make possible the development of cultures. It stimulates ingenuity, greater delicacy, and inventiveness. At the same time it teaches fair play toward one's opponent and sets an example for competition, where rivalry disappears at the moment of encounter. Thanks to the nature of play, man is able to counteract monotony, determinism, nature's blindness, and brutality. Play teaches one to build an order, to conceive an economy, to establish fair dealing.

I myself, however, do not believe it is impossible to resolve this antinomy. The spirit of play is essential to culture, but, in the course of history, both games and toys are entirely the residue of culture. Misunderstood survivals of a past condition or borrowings from an alien culture which become meaningless in the culture into which they have been introduced, they always seem to be external to the function of the society in which they are observed. They are no longer tolerated, although in a preceding phase or in the society from which they sprang they were an integral part of its

basic institutions, sacred or profane. Of course they were not then games at all, in the sense of children's games, but nonetheless they already were part of the essence of play, as Huizinga defined it. Their social function altered but not their nature. The change, the debasement they suffered, stripped them of their practical or religious import. This dethronement merely revealed, or rather isolated, what they contained in themselves, which is nothing more than the structure of play.

At this point some examples are in order. The mask provides the principal and perhaps the most remarkable one: privileged example of a sacred object whose transition to the status of a toy signifies and determines a major change in the history of civilization. For the moment it will suffice to mention briefly the best-attested instances of a like displacement. The lofty greased pole (capped with prizes for the climbers) is connected with myths of heavenly conquest; the football, with the contest for the solar globe between two antagonistic phratries. In the same way rope games used to augur the pre-eminence of the seasons and of the social groups that corresponded with them. Before becoming a toy in Europe toward the end of the eighteenth century, the electrical kite represented, in the Far East, the external soul of its owner who remained on earth. It was magically linked (by the rope which held the engine) with the fragile sheath of paper at the mercy of the heavenly winds. In Korea the kite served as a scapegoat whose function was to draw off the evils of a sinful community. In China it was used to measure distances, to transmit simple messages like a rudimentary telegram, and, finally, to fling a rope over a waterway in order to throw a bridge across it. In New Guinea it was used to tow craft. Hopscotch was an attempt to imitate realistically the labyrinth in which the initiated first went astray. Beneath the childish innocence and movement of a game of tag the dreaded selection of a propitiatory victim was perceptible: singled out by a decree of fate, before he was so designated by the sonorous and empty syllables of the *comptine*, the victim would (or so we suppose, at least) rid himself of his taint by handing it on to whomever he tagged.

In pharaonic Egypt a draughtboard is often pictured on tombs. The five squares at the bottom and to the left are decorated with benefic hieroglyphics. Above, the player inscriptions refer to decrees of judgment of the dead, over which Osiris presides. The deceased gambles his fate in the hereafter and either wins or loses blissful eternity. In Vedic India the sacrificer balances himself on a swing to help the sun rise in the heavens. The motion of the swing is supposed to link the heavens with the earth. It is

Notes and Discussion

comparable to the rainbow, another link between the heavens and the earth. Currently, the swing is associated with notions of rain, fertility, the renewal of nature. In the spring, Kama, the god of love, and Krishna, the patron of the herds, swing solemnly. The cosmic swing sweeps the universe away in an eternal coming and going in which beings and worlds are carried along.

The periodic games that take place in Greece are accompanied by sacrifices and processions. Dedicated to a divinity, they constitute in themselves an offering: a sacrifice of effort, skill, or favor. These athletic competitions were principally a kind of cult, the liturgy of a pious ceremony.

In a general way games of chance have constantly been associated with divination, just as games of strength or skill and puzzle tournaments have been genuinely valued as part of enthroning rituals in honor of a responsibility assumed or an important ministry. The actual game often remains scarcely separate from its sacred origins. Eskimos play cup and ball only during the spring equinox. Even then, they play only on condition that they do not go hunting the following day. This delay for the sake of purification is comprehensible only if the practice of playing the game initially had been more than a mere diversion. In fact, it was the occasion for all kinds of mnemonotechnical recitations. In England a fixed date for playing with a spinning top still persists, and it is legitimate to confiscate a top that is spun out of season. We know that in earlier days the villages, parishes, and cities owned gigantic tops which brotherhoods spun ritually at the time of certain festivals. Here, again, childish play seems to have sprung from a prehistory filled with significance.

Roundelays and pantomimes, for their part, seem to prolong or augment the forgotten liturgies; for example, in France, "La Tour prends garde," "Le Pont du Nord," or "Les Chevaliers du Guêt" and, in England, "Jenny Jones" or "Old Rogers." The fiancé and the girl friends of Jenny Jones come to visit her. Her mother answers that they cannot see her because she is busy washing linen, starching it, drying it, ironing it, etc. In the end she must admit that Jenny Jones is dead. A new dialogue ensues about the color of her shroud. Finally, it is to be white. Then two companions carry Jenny Jones to the tomb. The others follow, pretending to weep. At this moment Jenny Jones comes to life and runs after her companions. The girl she catches will be the Jenny Jones of the next round.¹

An analogous plot is used in the pantomime of "Old Rogers": an old

1. Hirn (according to Chambers and Lady Gomme).

man is being buried, and a tree grows on his tomb and bears tempting apples. An old woman gathers them; death pursues her, catches her, and renders her limp.

We need no more than this to rediscover in games such as these reminiscences of marriage by rape, of various taboos, funerals rites, and many more forgotten customs. Finally, hardly a game exists that has not seemed to specialized historians to be the ultimate stage of the progressive dethronement of a solemn and decisive activity that involved the prosperity or the destiny of individuals or communities. Nonetheless, I wonder if such a doctrine, which regards every game as the ultimate and humiliated metamorphosis of a serious activity, is not fundamentally erroneous and, to put it bluntly, a pure and simple optical illusion which in no way resolves the problem.

It is quite true that the bow, the slingshot, and the peashooter survive as toys when more powerful weapons have replaced them. But children also play with water pistols and cap guns, with compressed air rifles, when neither revolvers nor guns are outmoded for adults. They also play with tanks, submarines, and miniature airplanes that drop imitation atomic bombs. No new weapon exists that is not quickly converted into a toy. Inversely, it is by no means certain that prehistoric children were not already playing with chance bows, peashooters, and slingshots at a time when their fathers were using them "for real," as the very revealing language of children puts it. It is doubtful that children waited until automobiles were invented before playing stagecoach. The game of "Monopoly" reproduces the function of capitalism; it was not capitalism's successor.

These remarks are no less valid for the sacred than for the profane. The *kacinas* are semidivinities, the principal objects of worship among the Pueblo Indians of New Mexico; this does not prevent the same adults who worship them and incarnate them in their masked dances from making dolls resembling them for the amusement of their sons. Similarly, in Catholic countries, children currently play at going to Mass, at being confirmed, at marriage and funerals. Parents permit this at least as long as the imitation remains a respectful one. In black Africa the children make masks and rhombs in the same way and are punished for the same reasons, if the imitation goes too far and becomes too much of a parody or a sacrilege.

In a word, tools, symbols, and rituals of religious life, conduct and gestures pertaining to military life, are currently imitated by children. They enjoy behaving like adults, pretending for a moment that they are

Notes and Discussion

adults. This is why all ceremony, and more generally, all regulated activity, however striking or solemn it might be, and particularly if the person officiating wears a special attire, normally serves as a model for a game that copies it endlessly. Hence the popularity of toy weapons and suits of armor, which, thanks to a few characteristic accessories and to the elements of a rudimentary disguise, enable the child to transform himself into a policeman, an aviator, a sailor, a cowboy, a bus driver, or any other person who has attracted his attention. The same is true of the doll, which, in all latitudes, enables the little girl to imitate her mother, to be her mother.

We are led to suspect that there is no degradation of a serious activity in childish amusements but rather the simultaneous presence of two different ranges of activity. The Indian child was already enjoying himself in a swing at a time when the officiating priest piously swung Kama or Krishna in the liturgical swing sumptuously ornamented with stones and garlands. The children of today play soldiers even though the toy weapons they use are not outmoded. And can one conceive that some day girls might stop playing dolls?

To go on to adult diversions, the tournament is a game, but war is not. One dies little or much, depending upon the times. Of course one can be killed accidentally in a tournament, in an automobile race, or in a boxing match, or by a fencing thrust, because a tournament is more regulated, more isolated from real life, more circumscribed than war. Moreover, it is by nature without consequence outside of the arena: a simple occasion for fascinating feats of prowess which the next exploit obliterates in the same way that a new record erases a prior performance. Similarly, roulette is a game, but speculation is not, although the risk is no less; the difference is that in the one case one is not protected from chance and in the other, on the contrary, one tries to influence the ultimate decision, without any restriction save the fear of scandal, if we are to believe public opinion and, we must admit, the invariable and scarcely refutable evidence.

From this standpoint we see that play is in no sense the meaningless residue of a discarded adult occupation, although eventually it perpetuates the imitation even when the occupation has become outmoded. Play appears principally as a parallel, independent activity, with traits of its own, and is in direct contrast to the gestures and decisions of ordinary life. It is these specific characteristics that I have attempted to define and analyze.

Thus, children's games consist in part and quite naturally in mimicking adults, just as the purpose of their education is to prepare them to become

adults, in turn. But we must not forget that adults, for their part, do not stop playing complicated, varied, and sometimes dangerous games, but which, nonetheless, remain games because they are experienced as such. Although one's life and fortune are just as much involved in games as in the so-called serious activities, each of us readily makes distinctions among the latter, even if they seem to be more important to the person than the game which fascinates him. In effect, play remains separate, inclosed, in principle devoid of important repercussions upon the solidity and continuity of collective and institutional life.

The numerous writers who insist upon viewing games, particularly children's games, as pleasing and insignificant degradations of activities that were at one time full of meaning and supposedly decisive have failed to observe that play and daily life are constantly and everywhere antagonistic and simultaneous. Such an error in perspective, however, is not devoid of significance. It certainly would seem that the vertical history of play, I mean the transformation of games from one age to the next—the fate of a liturgy that ends up as a roundelay, of the magical instrument or object of a cult that becomes a toy—is far from teaching us as much about the nature of play as the scholars who discovered these time-worn and uncertain filiations imagine. On the other hand, these filiations establish, somewhat indirectly, that play is coessential to the culture. Their most remarkable and complex manifestations seem to be closely related to the structures of games, or to the structures of games that are taken seriously, that are built into institutions, into legislation, that have become imperious, compelling, irreplaceable, progressive structures—in a word, the rules for social play, the norms of a game that is no longer a game.

Ultimately, the matter of ascertaining which came first, play or a serious structure, seems to be a rather idle one. To explain games by laws, customs, and liturgies, and inversely to explain jurisprudence, liturgy, the rules of strategy, logic, or aesthetics by the spirit of play, are complementary operations, equally fruitful if they do not claim to be exclusive. The structure of play and utilitarian structures are often identical, but the respective activities which they govern are irreducible one to the other in a given time and place. In any case they function in incompatible domains.

However, what is expressed in games is not different from what a culture expresses. Both have the same appeal. Of course in time, as a culture evolves, an institution doubtless can deteriorate. A contract that once was essential becomes a purely formal convention which everyone respects or ignores, as he sees fit, because to submit to it from now on is

Notes and Discussion

superfluous and unnecessary, a magical survival without repercussions on the actual functioning of the society under consideration. Little by little this outmoded reverence sinks to the level of a simple rule for play. But the very fact that one can recognize an ancient, important element of the social mechanism in a game reveals an extraordinary interdependence and surprising possibilities of interchange between these two domains.

Every institution functions in part like a game, appearing at the same time as a game of another kind, based upon different principles, that drives out and replaces the old. This new game responds to other needs, favors other norms and legislation, calls for other virtues and aptitudes. From this viewpoint, a revolution seems to be a change in the rules of the game. For example, the advantages and responsibilities formerly assumed by a person because he was born into them must henceforth be acquired by merit, through competition or examinations. In other words, the principle of games likewise manifests itself outside the inclosed universe of play. But one must remember that it controls the latter absolutely, without resistance, as if it were a fictitious world devoid of matter or gravity, whereas in the confused, inextricable universe of human relationships its action is never isolated or useless. This action entails inevitable consequences; it is by nature pregnant with both good and evil.

However, it is possible in the two cases to identify the same elements: the need for self-assertion, the ambition to prove one's superiority, an inclination to challenge, to break a record, or merely to overcome difficulties; expectancy, the cultivation of pretense, of disguise; the pleasure of being afraid or of causing fear; the search for repetition and symmetry or, inversely, the joy of improvising, inventing, or diversifying solutions infinitely; the joy of solving a mystery, a puzzle; exuberance, calculation, irresistible passion; the satisfactions procured by all combinatory art; the desire to test one's self in a match of strength, skill, speed, endurance, balance, ingenuity; clarification of the rules, of jurisprudence, the duty of respecting them, the temptation to distort them; finally, dizziness and intoxication, nostalgia for ecstasy, the desire for a voluptuous terror. Virtually all these attitudes or impulses, often mutually incompatible, are to be found in the marginal and abstract world of play as well as in the non-protected world of social existence in which actions usually possess their full effectiveness. But they are not equally necessary; they do not play identical roles, and they do not have the same acceptance.

Moreover, it is impossible to maintain an equal balance between them. To a large extent they are mutually exclusive. Where some are favored,

others are necessarily decried. Depending upon the case, one either obeys the lawmaker or listens to the madman; one puts one's trust in arithmetic or in inspiration; one respects violence or diplomacy; one gives preference to merit or to experience, to wisdom or to some unverifiable but unquestionable knowledge that supposedly emanates from the gods. An implicit, inexact, incomplete distribution is thus effectuated in every culture between those values that are acknowledged to possess a social efficacy and others. The same distribution is then applied to the remaining secondary domains in which the realm of play occupies an important place. That is why it becomes possible to wonder whether the diversity of cultures and the particular traits which give each culture its original physiognomy are not somehow related to the nature of certain games that prosper in that culture and do not enjoy the same popularity elsewhere.

It goes without saying that to attempt to define a culture solely in terms of these games would be a bold and probably misleading undertaking. Actually, every culture knows and practises a great variety of games. Above all, without a prior analysis it is not possible to determine which games tally with the culture's institutional values, confirm and reinforce them, and which, inversely, contradict and flout them and thus represent, in the society under consideration, compensations or safety valves. To take one example, it is plain that stadium games in classical Greece illustrated the ideal of a city and contributed to its establishment, while in many modern states national lotteries and betting on the horses (I have stressed this point in passing) run counter to the proclaimed ideal. The role they play is no less significant; perhaps it is even indispensable to the exact extent that they offer a counterpart of an aleatory nature in the recompense that, in principle, work or merit alone should bring.

In any case, since play occupies a domain of its own whose content is variable and at times even interchangeable with that of daily life, it is important, first of all, to determine as precisely as possible the specific traits of pastimes which are considered suitable for children but which in other forms have an unflinching fascination for adults. Free, voluntary, unconstrained, in actuality they always divert the adult and bring him a respite from an existence filled with fatigue, worries, and responsibilities.

However, this relaxation, while he is practicing it, absorbs him no less than his professional activity. Often it interests him more, and sometimes it calls for a greater expenditure of energy, skill, intelligence, and concentration. This freedom and intensity, and the fact that one's conduct under the spell evolves in a separate, ideal world, safeguarded from dire conse-

Notes and Discussion

quences, explain, in my opinion, the cultural fruitfulness of games; they also help one to understand how the choice of games sheds light on the countenance, characteristics, and values of each society.

Moreover, convinced as I am that close relationships of compensation or co-operation necessarily exist among games, customs, and institutions, I have not regarded as outside the realm of reasonable conjecture the notion that the very destiny of unequally fertile civilizations, their chance of success or their danger of stagnation, may be bound up with their predilection for one or another of the basic categories of games which I feel able to distinguish.

II. PSYCHOLOGICAL ANALYSES

For a long time the interest devoted to games was stimulated by Schiller's reflections in his *On the Aesthetic Education of Man: In a Series of Letters*. For the first time, perhaps, play is taken seriously. The poet conceives of it as a vain expenditure of superfluous activity which gratuitously imitates true activity. It lies at the origin of the arts: "The disordered leaps of joy become the dance." This surplus of energy freely spent creates aesthetic values by freeing man from concern with utility. But games of chance require no energy and scarcely contribute to the creation of the fine arts. This in fact is an initial reason for eliminating them.

The notion of freedom, of superfluity, of play, was taken up again by Karl Groos in *Die Spiele der Tiere* (Jena, 1896) (English ed., *The Play of Animals* [New York: Appleton, 1911]). The author perceives in play mainly the joy of being and remaining the agent. In the end he defines play as a pure enterprise, without past or future, freed from the pressures and restraints of the world. The game is a creation of which the player remains as master. Detached from strict reality, it appears as a universe that has its end in itself and that exists only insofar as it is voluntarily accepted. But, since Groos began by studying animals (although he already had man in mind), when he went on to study human games some years later in *Die Spiele der Menschen* (Jena, 1899) (English ed., *The Play of Man* [New York: Appleton, 1912]), he was inclined to emphasize their intuitive and spontaneous aspects and to neglect the purely intellectual combinations which, in many instances, are present.

Furthermore, he conceived of the play of young animals as a kind of joyous preparation for their adult life. In fact, Groos attempted to demonstrate how play activity insures the young animals to a greater mastery of

their bodies, makes them more supple, swifter, stronger; how it teaches them to pursue their prey or to escape from their enemies; and, finally, how it accustoms them to do battle among themselves in anticipation of the moment when they will really be confronted with rivalry for the female. From this study of play he derived an ingenious classification very suitably adapted to his object, the first consequence of which, unfortunately, was to incline him toward a parallel breakdown of categories in a study of human games. He differentiates, thus, between play activity (*a*) of the sensory apparatus (touch, temperature, smell, hearing, perception of colors, forms, movements, etc.); (*b*) of the motor apparatus (groping, destruction and analysis, construction and synthesis, games of patience, simple throwing, throwing while hitting or pushing, the impulse to roll something, to twirl or slide, to throw toward a target, to catch moving objects); and (*c*) of the intelligence, feeling, and will (games of reconnoitering, memory, imagination, concentration, reasoning, surprise, fear, etc.). Then he goes on to what he calls "secondary tendencies"—those that arise from the instinct to fight, the sexual instinct, and the instinct for imitation.

This long catalogue demonstrates wonderfully well how all the sensations or emotions that man might experience, the gestures that he might make, the mental operations that he is capable of effectuating, give rise to games. But Groos casts no light on these games; he gives no information either about their nature or their structure. He is not concerned with grouping them according to their own affinities; he does not seem to realize that, for the most part, they refer to several senses and functions simultaneously. Actually, he is content to classify games according to the chapter headings of psychological treatises that were in vogue in his day; or, rather, he confines himself to demonstrating that man's senses and his faculties also include a disinterested mode of behavior, of no immediate usefulness, which, by virtue of this fact, belongs to the domain of play and whose sole function is to prepare the individual for his future tasks. Once again, games of chance are eliminated, and this is done without the author even realizing that he is excluding them. He neither came across them among animals, nor do they prepare one for any serious task.

Having read the works of Groos, one still might be unaware, or scarcely aware, that play frequently, perhaps necessarily, comprises rules and even rules of a very special nature: arbitrary, imperious, valid for a time and place that are determined in advance. We should bear in mind that Huizinga deserves credit for having stressed this point and for having shown the exceptional fruitfulness of this fact for the development of cul-

ture. Before him, in two lectures delivered at the Institut Jean-Jacques Rousseau in Geneva in 1930, Jean Piaget strongly emphasized the contrast for the child between games that are improvised and those that have rules. We must also recall the importance he attributes, quite rightly, to respect for the rules of a game in the moral development of the child.

But, once again, neither Piaget nor Huizinga pays any heed to games of chance, which are also omitted from Jean Chateau's remarkable inquiries.² Of course, Piaget and Chateau deal only with children's games, and, to be even more precise, with the games of certain children of Western Europe during the first half of the twentieth century, principally those played at school during their recreation periods. We see that a kind of fatality continues to operate over games of chance, which, of course, are not encouraged by educators. However, even if we except dice, teetotum, dominoes, and cards, excluded by Chateau as being adult games into which children would be drawn only through the family, there still remain marble games which are not always games of skill. The special characteristic of marbles is that they are both instrument and stake. The players win or lose them, so that they quickly become an actual coin of exchange. They can be traded for all kinds of valuable considerations—sweets, penknives, stones,³ whistles, school materials, help with homework, an errand to be run. Marbles even have a varying value depending upon whether they are made of steel, stone, or glass. And children gamble them in different games of odd and even, like the Italian game of *morra*, which, in a child's scale of values, offers the opportunity for a complete reversal of fortune. The author cites at least one of these games,⁴ although this does not prevent him from almost completely eliminating chance—that is to say, risk, *alea*, betting, which is the child's way of playing—in order to further stress the essentially active quality of the pleasure the child experiences when playing.

This prejudice would have had no grave consequences if, at the end of his book, Chateau had not attempted to draw up a classification of games that was marred by such a serious omission. The deliberate ignoring of

2. *Le Réel et l'imaginaire dan le jeu de l'enfant* (2d ed.; Paris, 1955); *Le Jeu de l'enfant: Introduction à la pédagogie* (rev. ed.; Paris, 1955).

3. Throwing-stones are not included in Chateau's works; perhaps he confiscated them instead of observing the psychology of the manner in which they are handled. Nor are the children studied by Chateau familiar with croquet or kites, for these require both space and accessories and do not serve as a means of disguise. Once again they were observed only on school playgrounds.

4. *Le Jeu le l'enfant*, pp. 18-22.

games of chance resolves an important question by the very omission: whether or not the child is attracted to games of chance, or whether he plays so few of them at school merely because they are forbidden there. In my opinion there can be no doubt about the answer: at a very early age the child is responsive to the element of chance.⁵ It remains to be seen at what age and how he reconciles the verdict of luck, iniquitous in itself, with his very keen concern for justice.

Chateau's purpose is both genetic and pedagogical. He is interested, first of all, in the periods of emergence and the popularity of each type of game. At the same time he tries to determine the positive contribution made by different kinds of games. He endeavors to show the extent to which they contribute to the formation of the future adult's personality. From this point of view, he has no difficulty in demonstrating, in contrast to Karl Groos's theory, that play is a test rather than an exercise. The child is not trained for any definite task. Thanks to play, he acquires a greater capacity to overcome obstacles or to meet difficulties. For example, nothing in life reminds us of the game of flying pigeon, but there is something to be gained from the possession of both rapid and disciplined reflexes.

In a general way, play seems to consist in training the body, the character, or the intelligence, without any predetermined end. Thus, the more the game is removed from reality, the greater is its educational value, for play does not teach formulas; it develops attitudes.

But in the player who remains essentially passive games of chance do not develop any physical or intellectual aptitude. And their consequences in regard to morality are feared because, by presenting the glittering prospect of a sudden and considerable profit, they distract from work and effort. This, if you will, is reason enough to banish games of chance from school (but not from a classification).

I wonder, moreover, if it might not be a good thing to push this reasoning to its extreme. Play is exercise; it is testing or performance due solely to increase. Faculties thus developed certainly profit by this supplementary training which is free, intense, pleasurable, inventive, and secure. But it is never the function of play itself to develop these faculties. The purpose of play is play. It is true that the aptitudes that it encourages are the same as

5. I will cite but one example: the popularity of miniature lotteries seen near schools and in the bakeries that are available to pupils when they come out of class. At varying prices, the children draw lots which include the winning number; it is good for a piece of cake or candy. Needless to say, the tradesman waits until the last minute to add to the lots the one that wins the big prize—an enticing sweet.

those that figure in study and in the serious activities of the adult. If these capacities are dormant or feeble, the child knows neither how to study nor how to play because then he does not know how to adapt himself to a new situation, to be attentive, or to accept discipline. A. Brauner's observations⁶ are most convincing in this regard. Play is in no sense a refuge for defective or abnormal children. They have toward it the same attitude as they do toward work. These handicapped children or adolescents prove to be as incapable of applying themselves with continuity or persistence to a play activity as to any real learning process. Play, for them, is a mere occasional extension of movement or intelligence (rolling a marble or a ball with which others play, obstructing, pushing, shoving, etc.). Their cure is effected when a teacher is able to convey to them respect for rules or, better still, a desire to invent games.

There is no doubt that, in this respect, the inclination willingly to respect an accepted rule is essential. Actually, Chateau, after Piaget, acknowledges the importance of this fact so completely that he gives first place to a rough evaluation of games with rules as compared to unregulated games. He summarizes Groos's study of this first category without adding anything new and proves a much more instructive guide in regard to games with rules. The distinction that he establishes between figurative games (imitation and illusion), objective games (construction and work), and abstract games (with arbitrary rules—games of skill and mainly competitive games) corresponds without any doubt to reality. We can also agree with him that figurative games result in art, that objective games anticipate work, and that games of competition foreshadow sports.

Chateau rounds out his classification with a category that links these competitive games, in which a certain co-operation is required, with imaginary dances and ceremonies in which the participants' movements must be in harmony. A grouping such as this does not seem homogeneous and entirely contradicts the earlier established principle which contrasts inventive games with those that have rules. To play at being a laundress, a grocer, an aviator, or a cowboy calls for continuous improvisation. To play prisoner's base or tag, to say nothing of football, checkers, or chess, presupposes a respect for the kind of precise rules that determine the winner. To classify under a same heading representational and competitive games because both require co-operation from team participants can be explained only by the author's anxiety to differentiate between levels of

6. *Pour en faire des hommes*, studies on play and language among socially maladjusted children (Paris: S.A.B.R.I., 1956), pp. 15-75.

play—a kind of age classification. The latter case is, of course, a matter of the intricacy of games of mere rivalry, based upon competition—the former, a symmetrical intricacy of figurative games, based upon pretense. Both of these intricacies result in the intervention of team spirit, which forces the players to co-operate, to concert their movements, and to play their part in an over-all maneuver. The true relationship nonetheless remains obviously a vertical one. Chateau goes from the simple to the complex each time because he is attempting primarily to establish stratifications that tally with the ages of children. But these complicate, in a parallel fashion, structures that remain independent.

Both figurative and competitive games correspond almost precisely to the games which I have grouped under the respective rubrics of *mimicry* and *agôn* in the classification of games that I myself have worked out.⁷ I also made a distinction between games of chance (*alea*) and games that induce giddiness (*ilinx*). I have explained why there is no mention of games of chance in Chateau's catalogue, although one can find therein some indication of games that induce giddiness under the heading of games that transport and illustrated by the following examples: playing at teetotum, running (until breathless).⁸ Certainly in these activities there is a glimmering, if you will, of games that induce giddiness; but, really to merit such a classification, these games must be presented more precisely and clearly, in a way that is more appropriate to their own purpose, which is to induce a slight, fleeting, and therefore pleasant confusion of perception and equilibrium; for example, tobogganning, swinging, or even the Haitian game, "golden corn," in which two children holding hands face each other at arms' length, feet touching, and twirl for the sheer pleasure of staggering after they stop. Chateau alludes to the swing (p. 298) but only to interpret it as an exercise of will over fear. Of course, giddiness presupposes fear, or, more exactly, a feeling of panic, but this attracts, fascinates, and represents pleasure. The question is less one of overcoming fear than of voluptuously experiencing fear, a shudder, a state of stupor that momentarily causes one to lose self-control.

And so games based upon the pursuit of vertigo fare no better at the

7. Cf. *Diogenes*, No. 12 (Fall, 1955), pp. 72-88.

8. I am giving examples cited in the final summary (pp. 386-87). On the other hand, in the corresponding chapter (pp. 194-217) the author uses the two meanings of the word "transport" (bewildered behavior and temper) principally to study the disorders that excessive enthusiasm, passion, intensity, or mere acceleration in the tempo produces during the course of play. The game ends in disorganization. Thus, while analysis defines a modality of play or rather a danger which, in certain instances, threatens it, it in no way tends to determine a specific category of games.

Notes and Discussion

hands of psychologists than games of chance. Nor does Huizinga, who reflects about games played by adults, pay them the slightest heed. Doubtless he disdains them because he does not think it is possible to attribute any pedagogical or cultural value to them. From invention and a respect for the rules of fair competition Huizinga derives all or almost all of civilization, and Chateau sees in them the essential virtues necessary to man in building his personality. The ethical value of a regulated and limited battle, the cultural fertility of imaginary games, are questioned by no one. But the pursuit of giddiness and of luck is in ill-repute. These seem to be sterile if not disastrous games, tainted with an obscure and contagious malediction. They are considered the ruination of our morals. According to popular opinion, civilization consists in protecting one's self against their seduction rather than in profiting by their debatable contributions.

III. MATHEMATICAL ANALYSES

Games of chance and games that produce dizziness seem to be implicitly quarantined by sociologists and educators. The study of vertigo is left to the physician; the reckoning of luck, to the mathematician.

These researches of a new genre are certainly indispensable, but both of them distract one's attention from the nature of play. The study of the function of the semicircular canals does not adequately explain the popularity of swings, toboggans, skis, and machines that produce dizziness in amusement parks—to say nothing of exercises of a different order but which presuppose the same kind of "play" with the same capacity to induce panic, like the whirling dervishes of the Middle East or the spiral descents of the Mexican *voladores*. On the other hand, the development of mathematics in regard to the law of probabilities in no way replaces a sociology of lotteries, gambling houses, or circuses. Nor do mathematical studies inform one about the psychology of the gambler; yet they owe it to themselves to examine all the possible responses to a given situation. Sometimes arithmetic is used to determine the banker's margin of security, sometimes to show a player the best way of gambling, sometimes to make clear to him in advance the risks that he runs in each instance. We recall that a problem of this kind is at the origin of the law of probability. Chevalier de Méré figured that in a game of dice, in a series of twenty-four throws, in which there are only twenty-one possible combinations, the double-six had more chance of showing than of not showing. But experience proved the contrary. He turned to Pascal. Hence the latter's long

correspondence with Fermat, who was to open up a new way for mathematics. Another result of this correspondence was to demonstrate to Méré that it was actually scientifically advantageous to bet against the double-six showing in a series of twenty-four throws.

Paralleling their studies on games of chance, the mathematicians have long undertaken researches of an entirely different nature. They put their minds to calculations about numbers in which chance plays no part but which might constitute the object of a complete theory that could be generalized—notably those numerous brain-twisters known as “mathematical diversions.” A study of these have more than once set scholars upon the scent of important discoveries. Such brain-twisters include, for example, the (unresolved) problem of the four colors, the problem of the Koenigsberg bridges, the three houses and three springs (insoluble on a plane surface but soluble on an inclosed surface like that of a ring), the problem of the fifteen young girls taking a walk. Certain traditional games like teaser and ring-puzzle, moreover, are based upon difficulties and combinations of the same order, the theory stemming from topology as it was constituted by Janirewski at the end of the nineteenth century. Recently, mathematicians, combining the law of probability with topology, have founded a new science, the application of which seems to be extremely varied: the theory of strategic games.⁹

In this instance the games are ones in which the players are “enemies” called upon to “defend themselves”; in each new situation there is a logical choice and an appropriate decision to be made. This kind of game is one that lends itself to use as a model for problems that generally arise in economic, commercial, political, or military domains. The scholars sought to find a necessary, scientific, and indisputable solution for concrete but at least approximately decipherable difficulties. They began with the simplest of situations: heads or tails, the game of paper-stone-scissors (paper beats stone by enveloping it, stone beats scissors by shattering them, scissors beat paper by cutting it), poker in its most simplified form, airplane duels, etc. Psychological elements like “guile” or “bluff” were introduced into the calculations. Guile was termed “the player’s perspicacity in anticipating his enemies’ line of conduct”; bluff was the response to this guile: in other words, “at times the art of disguising our information from an enemy, at times the art of fooling him about our intentions, and finally,

9. J. von Neumann and O. Morgenstern, *Theory of Games and Economic Behavior* (Princeton, N.J.: Princeton University Press, 1944); Claude Berge, *Théorie des jeux alternatifs* (Paris, 1952).

Notes and Discussion

at other times, the art of making him underestimate our skill."¹⁰

Nonetheless there is some doubt about the practical bearing and even the solid basis of such speculations outside of pure mathematics. These speculations are founded upon two postulates that are indispensable for rigorous deduction and which, hypothetically, are never encountered in the continuous and infinite universe of reality: the first postulate is the possibility of total information, I mean one that exhausts the usual facts; the second is competition among enemies who always take the initiative with a full knowledge of the facts, who expect an exact result, and who supposedly choose the best solution. But, in reality, useful facts are not for one thing always decipherable premises; for another, one cannot eliminate in the opponent the part that error, a whim, a foolish notion, almost any arbitrary and inexplicable decision, might play—a ridiculous superstition or even the deliberate desire to lose. In our absurd human universe there is no absolute motive that can be excluded.

Theoretically, in a pistol duel where two opponents walk toward each other, knowledge of the range and accuracy of the weapons, the distance, the visibility, the relative skill of the gunmen, their presence of mind or their nervousness, provided that these different elements are measurable, should enable one to figure out what would be the best moment for each of them to cock his pistol. And even this is a matter of chance speculation in which the realities, moreover, are limited by convention. But in practice it is plain that a mathematical calculation is impossible because it requires the complete analysis of an inexhaustible situation. One of the adversaries might be nearsighted or astigmatic. He might be absent-minded or neurasthenic, a bee might sting him, a tree root might cause him to stumble. The analysis bears only upon the skeletal form of a problem; as soon as one discovers its original complexity, reasoning becomes false.

In certain American shops at sale season articles are sold on the first day at a reduction of 20 per cent of the marked price, on the second day at a reduction of 30 per cent, and on the third day at a reduction of 50 per cent. The longer a customer waits, the more advantageous is the purchase. But his choice decreases at the same time, and he runs the risk of losing the article that appeals to him. In principle, if one were able to limit the data that must be taken into consideration, one could figure out on what day it would be best to buy such-and-such an article, according to one's estimate of its general desirability. However, it is very likely that each customer makes his purchase according to his own personality traits: with-

10. Claude Berge.

out waiting, if he wants above all to be sure of getting the desired object; at the last moment if he wants to spend as little as possible.

The irreducible element of play resides and persists in this: mathematics, which is never more than algebra *about* play, does not penetrate it. When, achieving the impossible, mathematics becomes algebra *of* play, then play itself immediately disappears. For one does not play in order to be sure of winning. The pleasure of a game is inseparable from the risk of losing. Each time that combinatorial reflection (which the science of games consists of) achieves a successful theory about a situation, the player's interest disappears with the certainty of the result. The fate of all the variations is known. Every player would know where the consequences of every conceivable play might lead or the consequences of the consequences. In cards the game is over as soon as there is no uncertainty about the tricks to win or concede, and every player lays his hand down. In chess the intelligent player gives up as soon as he realizes that the situation or the position of both sides makes his defeat inevitable. African Negroes, who are very fond of games, figure out the progression in a game with the same precision that Neumann and Morgenstern employ for structures that may require a far more complex mathematical apparatus, but which they do not treat any differently.

In Sudan the game of "Bolotoudan," similar to windmill, is very popular. It is played with twelve tipcats and twelve stones, which each player places in turn on thirty squares in five rows of six. Every time a player is able to place three of his pawns in a straight line, he "eats" one of the opponents' pawns. The combatants have sticks that belong to them and which, being part of the family legacy, are transmitted from father to son. The initial placing of the pawns is very important. The possible combinations are not infinite; therefore, an experienced player will frequently stop the game by acknowledging his virtual defeat long before it is apparent to the uninitiated.¹¹ He knows not only that his opponent must defeat him but also how he should proceed in order to do so. Nobody enjoys taking advantage of the inexperience of a mediocre player. On the contrary, everyone is anxious to show him the invincible maneuver, if he does not know it. For play, above all, is a demonstration of superiority, and pleasure arises from pitting one's strength against that of someone else. One must feel one's self to be in danger.

Mathematical theories that attempt to determine with certainty, in

11. A. Prost, "Jeux dans le monde noir," *Le Monde noir* (Nos. 8-9 of *Présence africaine*), pp. 241-48.

Notes and Discussion

every possible situation, the pawn that should be moved or the card that should be thrown, far from encouraging the spirit of play, ruin it by ridding it of its true purpose. "Wolf and Sheep," which is played on an ordinary chessboard of sixty-four squares with one black pawn and four white ones, is a simple game for which one can easily enumerate all the possible combinations. The theory of the game presents no difficulty. The "sheep" (the four white pawns) must necessarily win. What pleasure will a player experience in playing "Wolf" if he knows this theory? These analyses, which become destructive as soon as they are perfected, apply to other games as well—to teaser and ring-puzzle, for instance, which I have already mentioned.

It is not likely but it is possible, perhaps it is theoretically necessary, that an absolute game of chess should exist—one in which, from the first play to the last, no parry is efficacious, the best being automatically neutralized at every move. It is not unreasonable to suppose that an electronic machine, exhausting all the conceivable bifurcations, might establish this ideal game. But then no one would play chess any more. Merely to make the first move would result in winning or perhaps in losing¹² the game.

Thus, mathematical analysis of games seems to constitute something that has only a circumstantial relationship to them. It would exist even if games did not. It can and must evolve beyond the realm of games, inventing increasingly complex situations and rules at will. But it could not have the slightest repercussion in regard to the very nature of play. Indeed, either analysis results in certainty, and play loses all interest, or it establishes a coefficient of probability and merely leads to a more rational evaluation of a risk that the player either assumes or does not assume, depending upon whether his personality is cautious or bold.

IV. SOCIOLOGICAL ANALYSES

Reprehensible or not, games of chance are pre-eminently human. Animals are familiar with competitive, imitative, and vertigo-producing games. Groos, in particular, gives us striking examples of each of these categories. On the other hand, too involved in the immediate, too enslaved by their impulses, animals would not be able to conceive of an abstract and insensitive power whose verdict they would have to submit to in advance and without reaction in the name of play. To await the decision of

¹². It is generally acknowledged, although it has not been proved, that the advantage of playing first is a real one.

fate passively and deliberately, to risk something of value on the chance of either losing or multiplying it proportionally, is an attitude that requires the ability to anticipate, to imagine, and to speculate, of which man alone is capable. Perhaps, to the extent that the child is close to the animal level, games of chance do not have the same importance for him as they do for the adult. For the child, to play is to be active. Furthermore, lacking economic independence, having no money of his own, games of chance do not offer him what is really their main attraction. They cannot make him shiver with excitement. Of course, as I have stressed earlier, marbles are a coin of exchange for the child. However, he relies on his skill more than on luck to win.

In an industrial civilization, based upon the value of work, the instinct for play is extremely powerful, because it suggest an entirely contrary way of making money; or, according to Th. Ribot's formula, "the fascination of an acquisition at one fell swoop, without effort, in an instant." Hence the permanent seduction of lotteries, gambling houses, horse races, or betting on soccer matches. For patience and effort that bring small but sure returns, it substitutes the mirage of an immediate fortune, the sudden possibility of leisure, wealth, and luxury. For the multitude who work hard without acquiring more than a relative sense of well-being, luck, the big prize, seems the only means of ever emerging from a humiliating and lowly condition. Play flouts work; it has a competitive appeal which, at least in certain instances, assumes enough importance to determine in part the way of life of an entire society.

While these considerations lead one at times to attribute an economic or social function to games of chance, they do not, however, attest to their cultural fertility. One suspects them of engendering laziness, fatalism, and superstition. Admittedly, they have contributed to the creation of the law of probability, to topology, to the theory of strategic games. But that is no reason to believe that they are capable of offering the model for an image of the world or providing, in a rudimentary way, a kind of embryonic, encyclopedic knowledge. Yet fatalism, rigid determinism, to the extent that it denies free will and responsibility, portrays the entire universe as a gigantic generalized, compulsory, and continuous lottery in which every destiny—inevitable—brings only the possibility, or rather the necessity, of participating in subsequent lottery drawings and so on *ad infinitum*.¹³ Moreover, among relatively unoccupied populations, where, in any case,

13. This is what emerges with a good deal of evidence from the parable of Jorge Luis Borgès entitled "La Loterie de Babylone," in *Fictions*, French trans. (Paris, 1951), pp. 82-93.

Notes and Discussion

work neither absorbs all the available energy nor regulates the whole of daily existence, games of chance frequently acquire an unexpected cultural importance, influencing art, ethics, economics, and even knowledge.

I wonder whether such a phenomenon is not characteristic even of intermediate societies which have ceased to be governed by the combined forces of the mask and possession, or, if you prefer, by pantomime and ecstasy (*mimicry* and *ilinx*); societies that have not yet attained a collective existence based upon institutions in which regulated and organized competition plays an essential role. Specifically, it happens that populations are suddenly wrested from the dominion of pretense and terror by contact with or the domination of peoples who, thanks to a slow and difficult evolution, long ago freed themselves from the infernal mortgage. The populations that these peoples force to comply to their unwritten laws are in no way prepared to adopt them. The change is too sudden. In this instance it is not *agôn* but *alea* that imposes its own pattern upon the changing society. To place one's self at the mercy of fate conforms to the indolence and the impatience of those beings whose fundamental values no longer enjoy the freedom of the city. Better still, through the intermediary of superstition and witchcraft, which guarantee luck and the favor of the powers that be, this unquestionable and simple norm links them to their traditions and gives them back part of their original world.

Also, under the circumstances, games of chance suddenly acquire an unexpected importance. They tend to take the place of work, if the climate favors this, and also if the responsibility for feeding, clothing, and sheltering one's self does not, as it would elsewhere, oblige the most impoverished to seek regular employment. A floating population that has no pressing needs, that lives from day to day, and that is taken care of by an administration in which it plays no part gives itself up to play instead of yielding to the discipline of monotonous and tedious labor. In the end play rules over the beliefs and the knowledge, the habits and the ambitions, of nonchalant and lively peoples who no longer have the task of governing themselves. It remains extremely difficult for them to join a different kind of society in which they are left to vegetate like eternal children.

I will quickly give two examples of the curious way games of chance thrive when they become a habit, a rule—second nature. They establish a pattern of life for an entire population, for nobody can resist the contagion. By ricochet, the very people who introduce games of chance as a diversion themselves succumb to their epidemic growth which alters their very personalities and customs.

I will begin with a case in which the population is not mixed and in which the culture under consideration is entirely imbued with ancient values. There is a game of dice that is very widespread in the southern Cameroons and in the north of Gabon. It is played with cubes that are carved with a knife from the exceptionally hard, bonelike wood of a tree which provides an oil more cherished than that of the palm (*Baillonella toxisperma* Stone, sun. *Mimusops djave*). The dice are only two-sided. On one of these a symbol is carved whose strength must vanquish that of the competing emblems. These symbols are many and varied, constituting a sort of pictorial encyclopedia. Some represent persons in a priestly posture, in a highly dramatic pose, or in the midst of the many activities of daily life: a child teaching a parrot to talk, a woman snaring a bird for her dinner, a man attacked by a typhoon, another loading a gun, three women cultivating the land, etc. Sculptured on other dice are ideograms portraying diverse plants, the female genital organs, a nocturnal sky with moon and stars. The animals—mammals, birds, reptiles, fish, and insects—are abundantly represented. Still other symbols suggest things coveted by the player: hatchets, guns, mirrors, drums, watches, or dance masks.

These ornamented dice are also amulets which can help their owner realize his slightest desires. Generally, the dice are kept not at home but in the bush, in a bag hung from a tree. Occasionally, they serve as the means of conveying a message or as a code agreed upon in advance. As for the game itself, it could not be simpler. The principle is the same as heads or tails. Each player puts up an equal stake: fate decides through the intermediary of fragments of calabash that are thrown with the dice. If the smallest number of such fragments should show tails, the players whose dice also show tails win the pot (and inversely). This game came to have such a fascination that the authorities were obliged to ban it. It caused the gravest disorders: husbands pawned their wives, leaders gambled their commands, brawls were frequent, and even clan warfare broke out as a consequence of disputes.¹⁴

The game is rudimentary and neither complicated nor continuous. However, one can easily understand the importance of its repercussions on the culture and the collective social life where it is popular. The symbolic

14. Simone Delarozière and Gertrude Luc, "Une Forme peu connue de l'expression artistique africaine: L'Abbia," *Études camerounaises*, Nos. 49-50 (September-December, 1955), pp. 3-52. Similarly, in the Sudan, in the S'onrai country, where little shells are used both as dice and as money; each player throws four of them, and, if they all fall on the same side, he wins 2,500. Fortunes, lands, and wives are gambled (cf. A. Prost, "Jeux et jouets," *Le Monde noir* [Nos. 8-9 of *Présence africaine*], p. 245).

and encyclopedic richness of the emblems is somewhat comparable to that of the Roman columns. At the very least, it serves an analogous function. Moreover, it sprang from the need to carve different bas-reliefs on one side of the dice; for tribes interested in the plastic arts this might be the principal mode of expression. Nor is it a matter of indifference that a magical attribute is associated with dice that binds them closely to the beliefs and concerns of the owners. What should be stressed above all is the havoc which the passion for this game wrought and which, at times, seems to have reached disastrous proportions.

This kind of havoc is not at all rare. It occurs in connection with far more complex games of chance which, in mixed societies, possess an analogous fascination and entail consequences that are just as dire. The success of "Chinese Charade" (*Rifa Chiffá*) in Cuba offers a striking example. This lottery, which Lydia Cabrera calls "the incurable cancer of the popular economy," is played with a Chinese figurine divided into thirty-six sections to which an equal number of symbols portraying human beings, animals, or various allegories are assigned: a butterfly, a sailor, a nun, a tortoise, a snail, death, a steamboat, a precious stone (which can be interpreted as a pretty woman), a shrimp (which may also be the male sex), a goat (which represents a disreputable affair as well as the female sexual organ), a monkey, a spider, a pipe, etc.¹⁵ The banker has a corresponding series of cardboard or wooden pictures at his disposal. He draws, or he has someone draw at random. Then he wraps the object in a piece of material which he displays to the players. This is called "hanging the beast." He then proceeds to sell tickets, each of which has the Chinese letter on it that denotes this or that figurine. Meanwhile, supernumeraries go about the streets taking bets. At a specified time the emblem enveloped in the cloth is uncovered, and the winners get thirty times the amount of their bet. The banker gives 10 per cent of his profits to his agents.

As we see, the game seems to be a more pictorial variation of roulette. But, while in roulette one can combine the various numbers in many different ways, the symbols of the *Rifa Chiffá* are assembled according to mysterious affinities. In effect, each of them possesses, or does not possess, one or many companions or valets. For example, the horse has the precious stone for companion and the monkey for valet. The butterfly has no companion but does have the tortoise for valet. The stag has three companions—the shrimp, the goat, and the spider—but it has no valet. Naturally, one is supposed to play both the chosen symbol, its companion, and its valet.

15. The same symbols are to be found in a game of cards played in Mexico for money, the principle of which is similar to lotto.

Furthermore, the thirty-six emblems of the lottery are grouped into seven unequal series (*quadrillas*): businessmen, dandies, drunkards, priests, beggars, horsemen, and women. Once again the principles that govern this distribution seem most obscure: the series of priests, for example, is composed of a large fish, a tortoise, a pipe, an eel, a rooster, a nun, and a cat; the series of drunkards, death, a snail, a peacock, a little fish. The universe of play is ruled by this strange classification. At the beginning of each game, after "hanging the beast," the banker announces a riddle (*charada*) that is supposed to guide (or confuse) the participants. He makes deliberately equivocal remarks something like this: "A man on horseback slowly wends his way. He is not stupid but drunk, and he and his companion earn a lot of money."¹⁶ The player then guesses that he must play the series of drunkards or the series of horsemen. He might also bet on the animal that controls one or the other series. But it is doubtless some other, less clearly emphasized word that gives the key to the charade.

In another instance the banker says: "I want to do you a favor. The Elephant is killing the pig. The Tiger suggests it. The Stag is going to sell it, and the Stag takes the bundle away." An experienced player explains that one has but to think: "The Toad is a sorcerer. The Stag is the sorcerer's assistant. It carries off the harmful bundle which contains the witchcraft that an enemy practiced upon someone. If this is so, then it is the Tiger who is the enemy of the Elephant. The Stag leaves with the bundle. He will deposit it where the sorcerer told him to. Isn't it very plain? A fine play! Number thirty-one, the Stag, wins because the Stag leaves, running."

A knowledge of all the beliefs of Cuban Negroes is necessary in order to interpret these charades correctly. The banker announces: "A bird pecks and flies off." Nothing is more transparent: the dead fly; the soul of a dead man is comparable to a bird because it can travel wherever it wishes in the form of an owl; souls in torment, starved and embittered, exist. "Pecks and flies off" would signify to cause the unexpected death of a living thing that was not on its guard. One should therefore lay the eight, death.

The "dog that bites everything" is the tongue that attacks and utters calumnies; the "light that clarifies everything" is number eleven, the rooster that sings at sunrise; the "king who can do anything" is number two, the butterfly, which also represents money; the "clown who makes up his face in seclusion" is number eight, which is death covered with a white sheet. This time the explanation is valid only for the profane. In reality,

16. Rafael Roche, *La Policía y sus misterios en Cuba* (Havana, 1914), pp. 287-93.

Notes and Discussion

it concerns the initiated (*ñampe* or *ñañigo muerto*), during the course of a secret ceremony the priest, in effect, draws ritualistic signs with a piece of white chalk on the face, hands, chest, arms, and legs of the initiated.¹⁷

A key to complicated dreams also helps to forecast the lucky number. The combinations are infinite. The data of the experience are distributed among prophetic numbers. These numbers go up to one hundred, thanks to a book deposited in the Charade's bank and which can be consulted by telephone. This list of orthodox communications creates a symbolic language that is considered "very useful to know for penetration of the mysteries of life." In any case, in the end an image frequently takes the place of the number. At the home of his wife's uncle, Alejo Carpentier sees a Negro youth adding: two plus nine plus four plus eight plus three plus five equals thirty-one. The young man does not state the number but he says: "Butterfly plus Elephant plus Cat plus Death plus Sailor plus Nun equals Stag." Similarly, to explain that twelve divided by two equals six, he says: "Whore divided by Butterfly equals Tortoise." The symbols and relationships of the game are projected upon the whole of knowledge.

Chinese Charade is very widespread although forbidden by Article 355 of the penal code of Cuba. Since 1879 many protests have been voiced against its viciousness. It is mainly the working people who gamble the little money they have and, as one writer comments, who even lose the money they need to feed their families. They do not gamble large sums because they do not have them, but they play incessantly, since the "hanging of the beast" takes place four to six times daily. This is a game in which it is relatively easy to commit fraud. If the banker who sees the betting list is clever, there is nothing to prevent him, at the moment of uncovering the symbol, from replacing a heavily underwritten one with some other that has been entirely ignored.¹⁸

However, whether honest or not, bankers are known to make quick fortunes. During the last century, it has been said, they made as much as 40,000 pesos a day; one returned to his own country with a capital of 200,000 golden pesos. Today in Havana there are supposed to be five large Charade organizations and over twelve small ones. More than \$100,000 are gambled every day.¹⁹

This is not a unique case. There are more remarkable and more complete games, like the Brazilian *Jogo do Bicho*.²⁰ The main point is that sufficient proof exists to show that games of chance sometimes possess a cul-

17. From a communication of Lydia Cabrera's.

18. Roche, *op. cit.*, p. 293.

19. From a communication of Alejo Carpentier's and documents which he provided.

tural importance usually monopolized by games of competition. We must realize, as well, that, even in societies where merit is supposed to reign supreme, the seduction of luck is no less evident. Although stigmatized, games of chance nonetheless preserve an important role, more spectacular, it is true, than decisive. In any case, at this level, luck, rivaling competition and often combined with it, gives rise to large-scale manifestations. It balances the *Tour de France* with the National Lottery, it builds gambling houses just as sports events build stadiums, it inspires associations and clubs, the free-masonry of the initiated and the devotees, it maintains a specialized press, and it stimulates investments that are no less important.

Moreover, a curious symmetry emerges: while sports often receive governmental subsidies, games of chance, to the extent that the state controls them, help to fill the state treasury. Sometimes they are even the principal source of revenue. Luck, the permanent camouflage of work, of merit, and of effort, even though regarded with suspicion and held in contempt, thus preserves the freedom of the city in the most rational and administrative societies—those that are farthest removed from the coupling of prestige with pretense and vertigo. It is very easy to understand the reason for this. Vertigo and pretense are absolutely, and by their very nature, resistant to any kind of code, moderation, or organization. *Alea*, on the contrary, as well as *agôn*, calls for calculation and rules. However, they are not at all on the same plane. Their essential solidarity does not preclude rivalry. The principles which they represent are entirely too contradictory for them not to tend to be mutually exclusive. Work is obviously incompatible with the passive anticipation of one's lot, the capricious whim of fortune with the legitimate claims of effort and merit. To forsake pretense and giddiness, the mask and ecstasy, is to signalize emergence from a visceral and incantational universe and entry into the cold and rational world of distributive justice. The ideal of societies that have entered this new phase is thus defined by the equality of all citizens, if not an effective, absolute, universal equality—at least by a juridical one and, as far as possible, by an approximate equality of opportunity at the outset.

V. CONCLUSION

These examples suffice to clarify, on the one hand, the profound impression that games of chance may come to leave on a culture and, on the

20. I have described this game and analyzed its economic repercussions in my article, "Économie quotidienne et jeux de hasard en Amérique ibérique," *Quatre essais de sociologie contemporaine* (Paris, 1951), pp. 27-46.

Notes and Discussion

other hand, their irreducible tenacity even in societies that are the most hostile to them. Certain people, it is true, deny that we are dealing with games, *per se*, claiming this to be a misapplication of the term. They contend that so-called games of chance have nothing in common with the meaningless diversions that leave the players in the same situation as they were when the game began. These theorists do not perceive in games involving money the gratuitousness which they consider to be part of the essence of play. They refuse to recognize as diversions anything which either ruins or enriches. It is true that the essence of play is to be unproductive, to create neither wealth, as does work, nor a work, as does art. But games of chance do not create anything either; they merely transfer the wealth of the players, and only to the extent that the players themselves freely accept the eventuality of this transfer. None of the characteristics that legitimately defines games fails to apply both to games of chance and to the others. Just this once, in effect, one must admit that language is right and the scholars are wrong, provided he agrees, as I have suggested, that games are:

1. *Free*: something which the player is not forced to engage in, in which event play will immediately lose the characteristic of an attractive and happy diversion.
2. *Isolated*: circumscribed within the limitations of a precise time and place and agreed upon in advance.
3. *Uncertain*: whose progress and result cannot be determined in advance, a certain latitude in the necessity of improvising being inevitably left to the initiative of the players.
4. *Unproductive*: creating neither commodities, wealth, nor any kind of new element and, with the exception of a transfer of property among the circle of players, ending in a situation identical with that which prevailed when the game began.
5. *Unregulated*: subject to the conventions that suspend ordinary laws and temporarily institute new rules that alone count.
6. *Fictitious*: accompanied by a specific awareness of a second reality or of a frank unreality in contrast to daily life.

Games of chance truly belong to the domain of play. Doubtless, they seem, when comparisons are made, the very opposite of competitive games. But it is precisely this oppositeness which demonstrates a solidarity, an identity in their natures. *Agôn* is desire and effort for victory; *alea*

is trust in destiny. These are two symmetrical ways of attempting to experience triumph: the one, by expecting everything of one's self under conditions that are perfectly fair for all the competitors; the other, by abandoning any expectancy of self under conditions that impose a no less rigid or mathematical justice. These are both games of will whose purpose is to manifest excellence in performance.

Thus two procedures are pitted against each other. The rule consists, in the one instance, in bending all one's efforts toward success; in the other, in constraining one's self to absolute passivity; the former involves the display of a very human superiority; the latter relates to the good fortune of powers that are inaccessible to man. These contrasting attitudes do not prevent the combatants from arming themselves with fetiches or the gamblers from believing in double or quits. Basically, they represent a challenge to each other, and one cannot incline to one side without attributing a kind of shameful counterpart to the other.

It is remarkable that an identical polarity can be observed in games of personality. Such games consist either in portraying a second personality (*mimicry*) while not losing sight of one's own or in losing one's own (*ilinx*)—letting it go adrift and savoring the sensation of its guidance, domination, and possession by alien forces until one decides to put an end to the voluntary confusion. Just as in games of chance the danger lies in not being able to limit the stakes, so in these games it lies in the inability to limit the duration of the bewilderment.

Perhaps only certain categories of games are fruitful: those whose province is competition or pretense. The others, built on chance or vertigo, perhaps are simply inexpiable and devastating. It would be rash to decide. In any case, the associations, the symmetries, and the contrasts which articulate such games seem too exact and too impressive for them to be viewed as a disparate series of unrelated patterns of behavior. One finds a specific trait in games whose very laws are valid for all the subdivisions even though, extremely variable, they seem at first to be contradictory.

In this relatively new domain we perceive how dangerous it would be to abandon to the different disciplines—from psychology or pedagogy to mathematics—the privilege of qualified research. No matter what conclusions they might reach, these would remain devoid of their true meaning and significance. They would, in effect, lack the advantage of being read in the perspective of the central problem which the indivisible universe of games raises and from which, at the outset, games derive whatever interest they might possess.

Notes on the Contributors

PIERRE AUGER, a native Parisian, is distinguished for his research in various aspects of atomic physics. He has published papers on the photoelectric effects of X-rays, on the photoelectric compound known as the "Auger effect," on the production of slow neutrons by radioactive bombardment of beryllium, on cosmic rays, and on the *gerbes d'Auger*, great jets of atmosphere. In this issue he attempts to locate present time in the frame of the two existing theories—the universe of infinite duration and the ever recurring cycle. M. Auger taught physics at the Sorbonne from 1936 to 1941, directed cosmic-ray research at the University of Chicago from 1941 to 1943, and has been director of the Department of Exact and Natural Sciences of UNESCO since 1948. His books include: *Les Rayons cosmiques* (Paris: Presses Universitaires de France, 1941) and *L'Homme microscopique* (Paris: Flammarion, 1952), an interpretation of the actual facts of physics, biology, and psychology for the clarification of philosophic debates.

CHARLES G. BELL, who has written on tragedy and on modern poetry for previous issues of *Diogenes*, became, this year, a member of the faculty of St. John's College in Maryland. His second book of poems, *Delta Returns*, was published in 1956 by the Indiana University Press at Bloomington.

A new interpretation of time, examined in the context of dreams, is the concern of MARÍA ZAMBRANO, native of Spain, now resident of Rome, Italy. Miss Zambrano has taught on the philosophy faculty of the University of Madrid and at other institutions and has published the following books: *Pensamiento y poesía en la vida española* (Mexico City: La Casa de España, 1939); *Filosofía y poesía* (1939); *La Confesion género literario y metodo* (1943); *El Pensamiento vivo de Séneca* (1944); *La Agonia de Europa* (1945); *Hacia un saber sobre el alma* (1950); *El Hombre y lo divino* (1955), and has contributed to many reviews. Her article on dreams was among those chosen by the judges

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Toward Understanding Germany (Chicago: University of Chicago Press, 1954).

"Some Attitudes toward Death" are explored by HAROLD ORLANS in his study based on returns to an inquiry made by Mass-Observation, an organization of British sociologists operating independently of academic circles. Born in New York City in 1921, Mr. Orlans, a Ph.D. in social anthropology from Yale University, has worked as a newspaper reporter; was visiting lecturer in social anthropology at the University of Birmingham, England, and senior research associate at the Institute for Research in Human Relations, Philadelphia; and is now science program analyst for the National Science Foundation, Washington, D.C. His book, *Stevenage*, a sociological study of the first English new town planned after the war to decentralize population and industry, appeared in 1952 (London: Routledge & Kegan Paul).

Editor-in-chief of *Diogenes* since its inception in 1952, ROGER CAILLOIS carries further in this issue the analysis of games and the concept of play on which he wrote in *Diogenes*, No. 12. His varied publications include: *Le Mythe et l'homme* (Paris: NRF, 1938); *La Communion des forts* (Paris, 1945); *Les Impostures de la poésie* (Paris: NRF, 1945); *Le Rocher de Sisyphus* (Paris: NRF, 1945); *Babel* (Paris: NRF, 1948); *Quatre essais de sociologie contemporaine* (Paris: Perrin, 1951), and, as editor, *Procès intellectuel de l'art* (Paris: Les Cahiers du Sud, 1935) and *Œuvres complètes de Montesquieu* (Paris: Gallimard).

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CONTENTS

PIERRE AUGER	Two Times, Three Movements	1
CHARLES G. BELL	Early Christianity: Arts and Soul	18
MARÍA ZAMBRANO	Dreams and Time	32
BEN B. SELIGMAN	On the Nature of Economic Growth	42
ROBERT H. LOWIE	Primitive Messianism and an Ethnological Problem	62

NOTES AND DISCUSSION

HAROLD ORLANS	Some Attitudes toward Death	73
ROGER CAILLOIS	Unity of Play: Diversity of Games	92
<i>Notes on the Contributors</i>		123

